

This bibliography was originally conceived by BASIN (Building Advisory Service and Information Network) as a response to the demand from practitioners involved with the use of earth as a building material in developing countries.

It lists a selection of more than 300 documents available from bookshops and in specialized libraries on the subject of building with earth, and includes not only books, but also manuals, conference proceedings, reports and theses, periodicals and articles.

The various documents are listed by language (English, French, Spanish, Portuguese, and German). A description of the contents by key words, in addition to indexes, enables the reader to identify with ease the works that are of particular interest to him/her.

In addition, the bibliography includes numerous illustrations and the detailed analysis of some thirty of the most important works.

The bibliography has been prepared by CRATerre (International Centre for Earth Construction) which is responsible for the Earth Building Materials Advisory Service (EAS) within the BASIN network.



German Appropriate Technology Exchange

CRATerre International Centre for Earth Construction

CRATerre

Earth Building Materials and Techniques

SELECT BIBLIOGRAPHY





GATE - stands for German Appropriate Technology Exchange. GATE is a division of Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, a federal organization commissioned by the Government of the Federal Republic of Germany to carry out the planning and implementation of Technical Cooperation activities with countries of the Third World. GATE currently works in the fields of dissemination of appropriate technologies, environmental protection, conservation of natural resources and research and development. Within the GTZ, GATE is responsible for these activities on a cross-sectoral basis. GATE is divided into three sections :

1) Dissemination of appropriate technologies

- Dissemination and application of appropriate technologies, especially in connection with self-help activities :
- Cooperation with non-governmental appropriate technology groups : cooperation agreements with NGO's in Africa, Asia, Oceania and Latin America.
- Information service : documentation (appropriate technologies), exchange of information, question and answer service, publication of technical brochures, articles and a technical journal.
- Implementation of supraregional projects and programmes which serve as models for the adaptation and dissemination of technologies.

Key activities at present :

- Supraregional stove dissemination programme.
- Supraregional biogas dissemination programme.
- Micro hydro-power programme
- Dissemination programme for animal drawn implements and machinery (gin technology).
- Fund for small-scale appropriate technology projects.

2) Environmental protection and conservation of natural resources

- Coordination of environmental protection activities at the GTZ.
- Further development of methods and instruments for environmental impact assessment.
- Technical backstopping and coordination of interdisciplinary and multisectoral projects in the fields of environmental protection and conservation of natural resources.
- Cooperation with the relevant national and international organizations, associations and offices concerned with this sector.

3) Research and development (R & D)

- Preparation of multisectoral and strategic R & D plans.
- Coordination of ongoing R & D activities and planning.
- Coordination of cooperation with R & D institutions.
- Innovations management.
- Implementation of selected R & D projects and programmes.

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CRATerre

CRATerre-EAG, The International Center of Earth Construction connected to the School of Architecture of Grenoble, is an international non-governmental organization. The members of CRATerre are high-level professionals from various countries. Since 1972, CRATerre has been involved full time in all aspects of earthen architecture from the preservation of historic monuments to the setting up of modern production lines. CRATerre's five inter-related fields of activity are :

- Research** : as an officially recognized research team, CRATerre carries out several research programs at fundamental and practical levels in various fields such as ethnology, economy, mineralogy, soil mechanics, technology, etc.
- Consultancy** : CRATerre's missions in this field cover project formulation, feasibility and investment studies, setting up of programs, building design, raw material prospection, planning and evaluation.
- Application** : CRATerre members are currently engaged in field operations from architectural design to site supervision of social or educational building on behalf of governmental or non-governmental organizations.
- Training** : in collaboration with the School of Architecture of Grenoble (EAG) and Grenoble University (USTMG), CRATerre runs post-graduate courses for architects and building engineers. CRATerre also organizes vocational training courses and thematic intensive training sessions in collaboration with organizations such as the International Union of Testing and Research Laboratories for Materials and Structures (RILEM), International Council for Building Research Studies and Documentation (CIB), United Nations Industrial Development Organization (UNIDO), International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) and others.
- Dissemination** : through the publication of scientific and technical books and manuals, an active participation in international meetings and a "question-and-answer" service, CRATerre contributes greatly to the promotion of earthen architecture and the dissemination of technical information.

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Earth Building Materials and Techniques

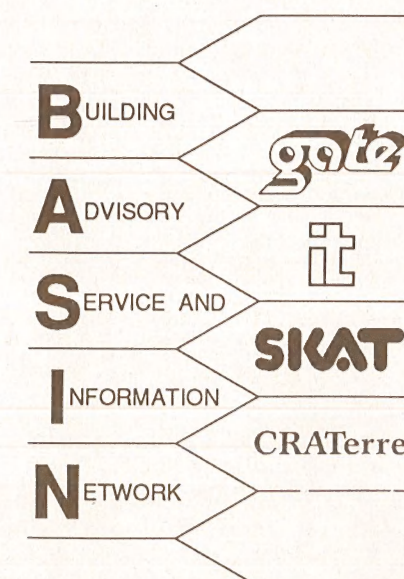
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PREFACE

This select bibliography is about "earth" - mankind's oldest building material. Earth, with everything it contains, constitutes in one way or another the basis for our life. Into the earth we return, to be part of it, when our life's cycle is closing and we have reached our end.

Earth is a noble material. This fact, which the ancient builders appreciated, seems to have been lost with the advent of the cement and concrete, metal and plastic age, or "modern times". However, also today earth remains the major building material for billions of people in Asia, Africa and Latin America. Yet "officially" it is not recognized as still being the most important material for shelter construction.

In times of need, for example after the two world wars and after the oil crisis of the seventies, earth was increasingly used again as a building material. A new appreciation of scarce energy sources started a re-thinking process in the industrialized countries. Many research programmes were initiated in the following years in order to find appropriate uses of earth for building with newly developed and suitable techniques. An information and experience exchange began worldwide.

With the achievement of independence the new states of Asia, Africa and Latin America faced - among others - the big problem of providing the basis for shelter delivery for their rapidly increasing populations. In many of these countries building with earth was, after independence, regarded as something of the past, backwards, primitive. The outlook was for a quick development based on modern techniques. The economic planners, decisionmakers and politicians in these countries did not take into consideration that such techniques required imported building materials and in most cases also foreign technologies. The resulting development by-passed the majority of low-income people in need of shelter in the urban areas and the vast majority of people in the rural areas who still rely on the use of earth for building.

About two decades after the independence period we find most of the developing countries facing declining economic growths, increasing debt burdens, rising inflation, growing unemployment, and rapidly weakening local currencies with the accompanying steep reduction in the value of any income.

This has led in many countries to a recognition of the use of locally available resources. As part of the "Global Strategy for Shelter to the year 2000" which UNCHS (Habitat) is putting in place as a long-term programme aimed at creating innovative and realistic housing policies the proposed "enabling shelter strategies" also include promotional programmes for small scale building materials industries and the necessary amendments of building codes and regulations. This should open the way to the use of earth in all the different possibilities as an affordable building material not only for the developing countries but also for the Eastern European countries which are trying to correct the effects of a 40-year state-planned economic mismanagement. Many of these countries are left with enormous environmental and infrastructural problems and with a huge dilapidated housing stock through lack of maintenance and an equally huge shelter deficit.

The following selection of documents, published worldwide on earth building materials and techniques is urgently needed and therefore very appropriate to be published at this time. It will be a very useful tool in the hands of those who would like to build with earth, but will, hopefully, also convince those responsible for planning and decisionmaking that building with earth, using appropriate technologies is the most economic and viable solution for solving the problem of providing affordable building structures and housing.

Hannah SCHRECKENBACH,
Dipl.-Ing., Architect.

EARTHEN ARCHITECTURE

Materials, techniques and knowledge at the service of new architectural applications.

1. A MAJOR BUILDING MATERIAL

The importance - both in quantity and quality - of unbaked earth constructions in the world is very little known. Thought to be antique and associated with the first ages of the civilizations of the Nile, the Tigris and the Euphrates, the Indus or the Huang He, unbaked earth is today no longer regarded as a major building material despite the fact that it continues to leave a undeniable and distinctive imprint on the architectural landscapes, both rural and urban, of very numerous countries. And yet it is a major building material, for unbaked earth remains to this day one of the main materials used by man to erect his home and city buildings. The passage of time has layered the sites of human occupation, which have constantly regenerated their daily built environment. It has not, however, effaced the permanence of the use of this material, excavated from the very soil, moulded by the hand of man or trampled by beasts of burden to create building materials the skilful use of which - resulting from a body of knowledge refined over the course of time - has enabled the construction of simple huts and modest homes, as well as farm buildings, grand houses, urban blocks and religious edifices, castles and palaces.

2. A CONTEMPORARY BUILDING MATERIAL

If the use of earth in countries known today as "advanced" regressed after the Second World War, that is to say barely forty years ago, in so-called developing countries it has continued unabated. On the one hand, the industrialization of construction and the sweeping changes within industrialized societies rendered obsolete ancestral techniques based on the use of local skills and materials and on mutual help within a community ; on the other hand, the dearth of processed materials, costly both in foreign currencies and in imported energy, the widening of the gaps in development and in the accumulation of debt contracted within the international monetary system, the survival of the life-styles of local societies accustomed always to coming together for mutual help for survival, dictated the continuing use of locally available solutions, materials and knowledge. In these countries with no industrialized means, in a wide range of latitudes throughout the world, earth remains the main - if not the essential - building material. Does this then make it a poor material using outmoded techniques, unsuitable for promoting a legitimate and necessary access to development ? Far from it, for these materials and techniques are for the most part very well used and can ensure true architectural quality, allowing communities to continue to create their private or public living environments and to integrate their built structures into a coherent network of self-generated development which makes the most of the resources available, human and material. Moreover, developments in scientific and architectural research on earth as a building material and on building techniques over the last decades, the

investment of construction industrialists and companies, today have combined to make a wide range of perfectly mastered production procedures and technical solutions available and offer great flexibility in meeting the wide range of possible applications.

3. A CLEAR MARK ON THE WORLD ARCHITECTURAL LANDSCAPE

Thanks to the most recent world surveys, although these of course remain partial, we have a quantitative picture of earth structures which embrace some 30 % of world population housing, or one billion, seven hundred million inhabitants. In developing countries alone, 50 % of the rural population and 20 % of the urban population are concerned. These figures, which emerge from the combined data of statistical surveys in various areas and from bibliographic information, are without doubt underestimates of the true position. 60 % of housing in Peru is in moulded bricks or rammed earth. 38 % of housing in Kigali, the capital of Rwanda, is in earth. More than 70 % of the housing stock of India is in moulded earth bricks or in successive layers of earth, and shelters nearly four hundred million people. In France, there are rural dwellings in unbaked earth, with, in the Dauphiné region, some villages having up to 90 % of their buildings in "pisé", rammed earth. In California, in 1980, houses in "adobe" (sun-dried earth bricks) numbered nearly 200,000, and the use of this material was growing at the rate of 30% a year.

From the very humblest shelters in concessions to the multi-form granaries of Africa, from the palaces of the Hausa emirs of Nigeria to the ksours and kasbahs of Morocco, from the mosques of Mali to the tightly-packed neighbourhoods of Ispahan and Iran, from the fortified dwellings of the Najran area of Saudi Arabia to the ten-storey or more earth blocks of Shibâm, in the valley of the Hadramaut in Yemen, from the moulded brick farms of Aquitaine to the baroque and neo-classical castles of the Saône valley, from the pueblos of the New Mexico Indians to the houses in concentric rings of the Hakkas of the province of Fujian, in China, the whole world bears the indelible stamp of earthen architecture, vestiges of past history and a living framework for history in the making.

4. ONE OF THE POSSIBLE AND REALISTIC SOLUTIONS FOR THE FUTURE

Confronted by the "energy crisis" of the 70's, oil-dependent industrialized countries were forced to call radically into question tried and tested technical solutions which now proved too "energy-greedy". The building sector was not spared and the search was on for solutions allowing energy savings both at source (production and application of materials) and further down (maintenance) the production chain. Research on biomass and solar energy ran in parallel with experiments to update traditional materials and to attempt to rationalize the production process. Earth became once more a material

of primary interest and government institutions (notably in France) supported a considerable amount of research and experimentation both in the area of application to industrialized countries and in that of developing countries in the context of bilateral or multilateral cooperation. Today, the threat hanging over the ecological balance of polluted, degraded, or plundered natural areas highlights interest in materials and techniques which are inherently environmentally friendly. The increasing involvement of people in the control and management of the production of their living environment which results from a new awareness of the options available, qualitative research and increased leisure time, is associated with the use of simple, economical techniques, easy to use, and allowing a great measure of partial or complete self-help building. The United States of America, Australia and Germany encourage new models of intervention in building which give greater responsibility to the occupier in the creation of his living environment. Viewed from this perspective, earth as a building material has definite advantages and plays an important role.

In developing countries, burdened by debt and confronted by an urgent need to build on a scale unprecedented in history, imported materials, techniques and energy are for the most part inaccessible to most and contribute to promoting "bad development". Building with earth emerges as one of the efficient short-term means of production of housing or public facilities (schools for example) which are both economical and offer high quality (being culturally and climatically suitable). Decision-makers in these countries are well aware of this and mobilize "up-stream" feasibility studies for their "education programmes" or their popular housing programmes for example, and research on resources and local knowledge, on labour-intensive techniques generating employment and enabling the population to gradually become "monetarised". The days of costly experimentation, often with no further outcome, are now over. A new confidence in the resources available must be encouraged; completed examples must be multiplied and the men who realize them must be trained. This is today what is happening in Mexico (850 earthen houses recently built in the state of Zacatecas), in Burkina Faso (6,000 school classrooms by 1995.) No less than forty million homes will have to be built between now and the year 2000 for the urban population of Africa alone. At the same time, accessibility studies show that the population concerned have in the main no choice but to employ local materials, most often earth. One can thus predict that at least 20 % of urban and peri-urban housing of African countries, or eight million units, will be built in earth over the next ten years, at a rate of eight hundred thousand units per year. If demand from rural areas is added to this, some measure of the scale of the dramatic issue facing generations of decision-makers and builders meeting these needs can be appreciated. The use of earth and other locally available materials is unavoidable, and should indeed be encouraged by them.

5. ENVIRONMENTAL ADVANTAGES

It seems particularly important to enumerate the many advantages of building in unbaked earth from the point of view of the environment. This issue is increasingly a central one and forms part of the contemporary problems facing society which will play a greater part in political, economic, social and cultural strategies linked to the

planning and improvement of the quality of life. Here we refer to the concept of the environment in the widest sense of the word, ecological, economic, technical, health-wise and psychological, cultural and human.

5.1. From the point of view of the ecological environment

In terms of pollution and degradation, unbaked earth can offer a totally positive picture:

- It does not contribute to the deforestation which follows for example the use of organic resources for firing baked earth materials.
- It does not consume any non-renewable energy (oil, gas, etc.) at source for the processing and production of materials or further down the production line for their application as does the production of cements, lime and other conventional binding materials and steel.
- By exploiting strata on construction sites, it allows a considerable saving in energy for the transportation of materials.
- It does not contribute to a degradation of the landscape as does the extraction of minerals and ores which hollows out hillsides and open cast sites. A great deal of the earth excavated in the course of large public facilities works (notably roads and motorways) can be recycled and used in building (allowing very easy decentralized distribution).
- It does not contribute to the diminishing of resources of aggregates such as gravel and sand, excavated either from quarries or from water courses, in insular sites or lagoons, putting into peril the ecological balance of these natural environments.
- It uses very little water, essential for the life of the people.
- It produces no industrial or chemical waste and moreover has the additional advantage of being almost entirely recyclable.

5.2. From the point of view of the economic environment

- It is often comparable in cost with, or indeed more economical than, competing technologies and requires no major financial mobilization for its generally light production infrastructure.
- It guarantees rapid amortisement thresholds for bankable investments thanks to its low infrastructure requirements for usable production.
- It makes a contribution to the simulation of local societies through its great flexibility of adaptation to decentralized situations.
- Throughout the production process, it creates employment and monetary added-value which can be injected into other sectors of the economy, particularly in the development phase of societies.

- By allowing savings in energy and in foreign currencies, it contributes at the macro and micro economic level of the building sector, to a considerable reduction in developing countries' debt and to the balance of payments.

5.3. From the point of view of the technical environment

- It has thermophysical and hydric properties which contribute to the regulation of thermal comfort and the exploitation of the mechanisms of the bioclimatic functioning of shelter: good conductivity, energy retention capacity and thermal differential (effusivity and diffusivity), delayed temperature differences, etc.
- It requires most often only simple production and application tools (moulds, presses, light shuttering, normal masonry tools, etc.) accessible to a wide population of masons and self-help builders.

5.4. From the point of view of health and the psychological environment

- Not only non-polluting in its use, it also guarantees the absence of harmful effects in the context of daily life such as the absence of gaseous emissions or other toxic chemical components, radioactive emission etc.
- It contributes to psychological well-being by the architectural exploitation of its inherent characteristics; these include the surface texture, colour, form and luminosity of the material. It thus makes an active contribution to the beauty of the living environment.

5.5. From the point of view of the cultural and human environment

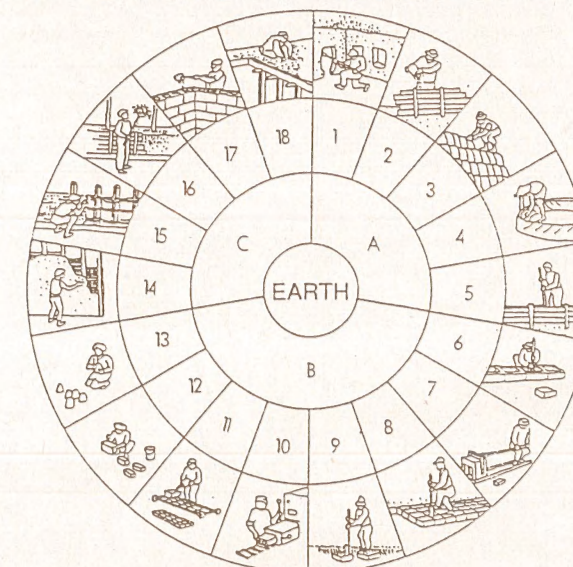
- It follows on in the heritage of the traditional architecture of numerous countries using local materials and thus plays a part in the respect for, as well as the survival and updating of, cultural, architectural and urban environments.
- It allows local populations to take charge locally themselves of the production of their built environment and thus contributes to the expression of the democratic rights of all to control their living environment.

6. THE VARIOUS METHODS OF UTILIZATION

The range of the technical, constructional and architectural possibilities of earth is very wide. The study of popular traditions and of traditional knowledge throughout the world has enabled some 18 different methods of utilization of the material to be identified, each in itself also capable of being used in a great variety of ways and forms. This wide constructional potential has enabled the building of modest shelters, of village houses, of urban blocks, of religious edifices as well as of palaces. This diversity of earthen architecture is not to deny that offered by the use of other traditional materials, with the

exception that earth is probably one of the traditional materials which offers rarely equalled possibilities of use. There are many well-known methods using earth as a building material. Amongst these, eight are currently employed and constitute the major techniques.

- **Adobe**: the earth, in a malleable state, often improved by addition of straw or other fibres, is moulded into a brick form and dried in the sun. (11) (12) (13)
- **Rammed earth**: the earth is massively dumped into formworks, compacted by means of a rammer, layer by layer, and formwork by formwork. (5)
- **Straw clay**: the earth is spread out in water until a homogeneous thick liquid state is attained. This muddy liquid is mixed with straw, coating each individual stem. The resulting building material retains its fibrous appearance. A formwork is used to hold it in place, giving a monolithic wall with a primary support structure. (16)
- **Wattle and daub**: clayey material, mixed with straw or other fibres, is layered on top of wattles that fill in a timber structure. (14)
- **Shaped earth**: the earth, often improved by the addition of straw or other fibres, is shaped into a wall using the same technique as that used for pottery, without tools. This ancient technique is still used on a widespread basis. (4)
- **Extruded earth**: the earth is extruded by a powerful machine similar to, or derived from, the machines used for the manufacture of fired brick. (10)
- **Cob**: the earth, often improved by the addition of straw or other fibres, is shaped into big balls, which are piled on top of one another and lightly packed, by hand or foot, in order to erect shaped monolithic walls. In other cases, the cob is incorporated into a timber framework or structure. (3)
- **Compressed earth**: the earth is compressed, in block form, in a mould. In the past, the earth was compressed in the mould by means of a small pestle, or by pressing a very heavy lid forcefully down on the mould. Nowadays, a wide variety of presses is used. (7)



7. THE FUTURE OF EARTH ON THE MOVE

In her latest work entitled "A Fate Worse than Debt" (Penguin Books, 1988), the famous political commentator Susan George analyses the debt situation of developing countries and attempts to determine the bases for positive approach notably focussed on solutions for repayment in creative values or "in kind" rather than in strictly monetary means. At the end of her analysis, she puts forward eleven potential solutions to allow this repayment in kind and to launch a coherent approach for the development of less advanced societies. One of these recommendations clearly stipulates that it will be necessary to develop "the study and survey (and if necessary the improvement) of local building techniques, in particular earth architecture ("pisé" or "banco") ; new buildings, particularly public buildings using these techniques".

In India, HUDCO (Housing and Urban Development Corporation), the main government organization responsible for social housing, is already undertaking a vast programme for reevaluating the possibilities of building with earth linked to the existence of numerous regional building centres responsible for realizing demonstration and experimentation and for training. This initiative includes the erecting of public buildings with a promotional element, international and regional seminars, and actions undertaken by pioneers in many centres of scientific research, universities, architectural schools and pilot associations bringing together influential architects and technicians.

It is undoubtedly in the "Great Book of History" that possible solutions are being researched for a future in which building with earth, amongst a wide range of local techniques, will play a new technological, social, cultural, ecological, economic and political role of paramount importance.

INTRODUCTION TO THE BIBLIOGRAPHY

1. GENERAL OBJECTIVES OF THE BIBLIOGRAPHY

The following bibliography has been prepared to provide practitioners with a base of information about earth building materials and techniques.

This bibliography is a selection. Only recent documents have been taken in account, i.e. the bibliography contains only documents published after 1970. The documents have been selected also in view of their relevance to developing countries. Finally, only documents in English, French, Spanish, Portuguese and German, available in bookshops from publishers, or in architecture or engineering libraries, have been listed.

The content of each document is described at two levels :

- The technique or techniques, following the classification given in the introduction to earth construction.
- The subject or subjects, for which a series of key words, covering all aspects of earth construction, have been used :
 - . "General" : every aspect of earth construction is covered.
 - . "Building with earth" : history, universality, architecture, inventory.
 - . "Earth" : soil mechanics, soil science.
 - . "Identification" : tests, results, suitability criteria.
 - . "Stabilization" : process, product, results.
 - . "Characterization" : tests, results, performances, control tests.
 - . "Production" : inputs, process, equipment, production lines, codes of good practice.
 - . "Construction" : practice, good trade practice, examples of buildings, codes of good practice.
 - . "Design" : design principles, stress calculations, construction designs.
 - . "Disaster mitigation" : earthquakes, hurricanes, floods.
 - . "Preservation" : archeology, rehabilitation, preservation, pathology.
 - . "Specification" : recommendations, specifications, standards, building codes.
 - . "Protection" : protection, renderings, plasters.

- . "Economics" : cost analysis, feasibility studies, estimates.
- . "Case studies" : field projects, countries, building operations.
- . "Socio-cultural factors" : Socio-cultural factors.
- . "Promotion" : promotion of earthen architecture, vocational training, dissemination, exhibitions, evaluation.
- . "Vocabulary" : terminology, glossaries, definitions, translations.
- . "Bibliography" : Bibliography, references.
- . "Other" : Other.

To facilitate the reading of this bibliography, the documents have been listed first by language and then by type of document. Documents have been classified as follows :

- Books : specialized books with a technical content.
- Conferences : conference proceedings and conference papers related to earth construction but presented during non specific conferences.
- Reports : research or activity reports, theses dealing exclusively with earth construction.
- Periodicals : earth specialized periodicals or special issues on earth construction of non specialized periodicals.
- Articles : a selection of articles from periodicals listed above and a selection of major articles on free leaflets.

Thirty documents, which can be considered to be major or resource documents, have been selected and for each of them an abstract and a detailed description has been prepared. This presentation is given in a separate section which follows the bibliography itself. Annotated documents are indicated by an asterix (*) after their list number in the bibliography.

To find a reference or a selection of references about a particular topic, three indexes have been created :

- by author,
- by subject,
- by technique.

A technical glossary (English, French, Spanish, Portuguese, German) of key words has been also introduced to assist non-English readers.

2. REFERENCE SET-UP

References are set up as follow :

- 022 * **Earth-wall construction.**
 In : Bulletin n° 5. Fourth edition.
 Middleton G.F., Schneider L.M.
 National Building Technology Centre, Chatswood, Australia, 1987.
 Book : 175 x 250 mm, 65 pages, ill., tab.
 ISBN : 0-642-12289X.
Subject(s) : earth , identification, production, construction, design, protection.
Technique(s) : adobe, rammed earth, compressed blocks.

*	Annotated document
022	Index number
In	Document extracted from
Book	See below concerning the abbreviations
Subject(s)	See below the subject glossary
Technique(s)	See below the technique glossary

COLLATION

Abbreviations	English	French	Spanish	Portuguese	German
Pages	Pages	Pages	Página	Página	Seiten
Ill.	Illustrated	Illustré	Ilustrado	Ilustrado	Bebildert
Tab.	Tables	Tableaux	Cuadro	Quadro	Tabellen
Graph.	Graphics	Graphiques	Grafico	Gráfico	Graphische Darstellung
Bibl.	Bibliography	Bibliographie	Bibliografía	Bibliographia	Bibliographie

TECHNIQUE GLOSSARY

English	French	Spanish	Portuguese	German
Adobe	Adobe	Adobe	Adobe	Lehmstein
Rammed earth	Pisé	Tierra tapial	Apilada	Stampflehm
Compressed blocks	Blocs de terre comprimée	Bloques de tierra prensada	Blocos	Gepresste Lehmsteine
Cob	Bauge	Mezcla de tierra y paja	Moldado	Lehmwellerbau
Wattle and daub	Torchis	Barbal	Pau a pique	Lehmbewurf
Straw-clay	Terre-paille	Tierra paja	Terra palha	Leichtlehm-bau
Shaped earth	Terre façonnée	Tierra modelada	Terra talhada a mão	Geformter Lehm
Extruded earth	Terre extrudée	Tierra extrusionada	Terra extrudida	Lehmstrang
Dug-out	Terre creusée	Tierra excavada	Terra cavada	Ausgegraben

TECHNIQUE GLOSSARY (CONTINUED)

Earth sheltered	Terre couvrante	Tierra cubriente	Terra de capeamento	Erdbedeckt
Cut blocks	Blocs découpés	Bloques cortados	Blocos cortados	Geschnittene Blöcke
Poured earth	Terre coulée	Tierra vertida	Terra escorrida	Schüttlehm
General	Général	General	Geral	Allgemein
Multiple	Multiple	Múltiple	Múltiplo	Mehrfach
Other	Autre	Otro	Outro	Andere

SUBJECT GLOSSARY

English	French	Spanish	Portuguese	German
Building with earth	Construire en terre	Construir con tierra	Construir em terra	Bauen mit Lehm
Identification	Identification	Identificación	Identificação	Identifizierung
Stabilization	Stabilisation	Estabilización	Estabilização	Stabilisierung
Characterization	Caractérisation	Caracterización	Caracterização	Charakterisierung
Production	Production	Producción	Produção	Produktion
Construction	Construction	Construcción	Construção	Bauen
Design	Conception	Concepción	Concepção	Entwurf
Disaster mitigation	Parasiniestre	Parasiniestro	Contra-castástrofe	Katastrophenschutz
Preservation	Préservation	Preservación	Preservação	Erhaltung
Specification	Spécification	Espeificación	Especificações	Spezifikation
Protection	Protection	Protección	Protecção	Protektion
Economy	Economie	Economía	Economia	Ökonomie
Case Studies	Etudes de cas	Estudio de casos	Caso em estudo	Fallbeispiele
Promotion	Promotion	Promoción	Promoção	Beförderung
Socio-cultural	Socio-culturel	Sociocultural	Sócio-cultural	Sozio-kulturell
Vocabulary	Vocabulaire	Vocabulario	Vocabulário	Vokabular
Bibliography	Bibliographie	Bibliografía	Bibliographia	Bibliographie
General	Général	General	Geral	Allgemein
Multiple	Multiple	Múltiple	Múltiplo	Mehrfach
Other	Autre	Otro	Outro	Andere

TERM GLOSSARY

English	French	Spanish	Portuguese	German
Books	Livres	Libros	Livros	Bücher
Conferences	Conférences	Conferencias	Conferências	Konferenzen
Reports	Rapports	Informes	Relatórios	Berichte/Studien
Periodicals	Périodiques	Revistas	Periódicos	Zeitschriften
Articles	Articles	Artículos	Artigos	Artikel
Authors	Auteurs	Autores	Autores	Autoren
Techniques	Techniques	Técnicos	Técnicas	Techniken
Subjects	Sujets	Temas	Assuntos	Themen

GENERAL READING LIST



DOCUMENTS IN ENGLISH



BOOKS

- 001 * **Adobe and rammed earth buildings. Design and construction.**
McHenry P.G.
Wiley-Interscience, New York, USA, 1984.
Book : 220 x 285 mm, 205 pages + annexes, ill., tab., graph.
ISBN : 0-8165-1124-1.
Subject(s) : building with earth, earth, identification, stabilization, characterization, production, construction, design, preservation, specification, protection.
Technique(s) : adobe, rammed earth.
- 002 **Adobe architecture.**
Stedman M. and W.
The Sunstone Press, Santa Fe, USA, 1987.
Manual : 280 x 215 mm, 45 pages, ill., graph.
ISBN : 0-86534-111-7.
Subject(s) : design, construction, production.
Technique(s) : adobe.
- 003 **Adobe in the Americas and around the world history, conservation and contemporary use.**
In : Travelling exhibition.
ICCROM, ICOMOS, UNPD/UNESCO.
Regional Project on Cultural Heritage and Development, UNDP, UNESCO, Lima, Peru, 1984.
Book : 297 x 210 mm, 74 pages, ill.
Subject(s) : building with earth, socio-cultural factors.
Technique(s) : adobe.
- 004 **African Canvas. The art of West African women.**
Courtney-Clarke M.
Rizzoli International Publications, New York, USA, 1990.
Book : 280 x 280 mm, 204 pages, ill., bibl.
ISBN : 2-7003-0851-4.
Subject(s) : building with earth, protection, case studies, socio-cultural factors, promotion.
Technique(s) : adobe, cob, shaped earth.
- 005 **African spaces. Designs for living in Upper Volta.**
Bourdier J.P., Minh-Ha T.T.
Africana Publishing Company, New York, USA, 1985.
Book : 278 x 240 mm, 232 pages + annexes, ill., bibl.
ISBN : 0-8419-0890-7.
Subject(s) : building with earth, design, case studies, promotion.
Technique(s) : adobe, cob, shaped earth.
- 006 **African traditional architecture : an historical and geographical perspective.**
Denyer S.
Africana Publishing Company, New York, USA, 1978.
Book : 185 x 255 mm, 210 pages, ill., bibl.
ISBN : 0-8419-0287-9.
Subject(s) : building with earth.
Technique(s) : adobe, cob, wattle and daub, shaped earth.
- 007 **All you wanted to know about stabilized mud blocks.**
Sharma S.K.
HUDCO, New Delhi, India, 1989.
Booklet : 144 x 220 mm, 21 pages, ill., tab.
Subject(s) : identification, production.
Technique(s) : compressed blocks.
- 008 **Appropriate building materials.**
Stulz R., Mukerji K.
SKAT Publications, Saint Gallen, Switzerland, 1988.
Catalogue : 160 x 220 mm, 334 pages + annexes, ill., tab., graph., bibl.
ISBN : 3-908001-09-9.
Subject(s) : identification, stabilization, production, construction, disaster mitigation, protection.
Technique(s) : adobe, rammed earth, compressed blocks, cob, wattle and daub.
- 009 * **Architecture for the poor. An experiment in rural Egypt.**
Fathy H.
The University of Chicago Press, Chicago, USA, 1973.
Book : 138 x 228 mm, 194 pages + annexes, ill., tab.
ISBN : 0-226-23915-2.
Subject(s) : production, construction, design, economics, case studies, socio-cultural factors, promotion.
Technique(s) : adobe.
- 010 **Better houses with mud-1. A manual of alternative building construction.**
In : Alternative buildings series 7.
Jagadish K.S., Saini S., Rege A., Reddy B.V.V.
ASTRA, Indian Institute of Science, Bangalore, India, 1983.
Manual : 297 x 210 mm, 49 pages, ill.
Subject(s) : production, construction, design, protection.
Technique(s) : adobe, compressed blocks.

- 011 **Bibliography on soil construction.**
UNCHS (Habitat).
UNCHS (Habitat), Nairobi, Kenya, 1989.
Book : 297 x 210 mm, 173 pages.
ISBN : 92-1-131089-8.
Subject(s) : bibliography.
Technique(s) : multiple.
- 012 **BREPAK operators manual.**
Webb D.J.T., Lockwood A.J.
BRE (Building Research Establishment), Watford, United Kingdom, 1987.
Manual : 210 x 297 mm, 49 pages, ill., bibl.
Subject(s) : earth, identification, production.
Technique(s) : compressed blocks.
- 013 * **Build your house of earth. A manual of earth wall construction.**
Middleton G.F.
Compendium, Victoria, Australia, 1979.
Book : 190 x 250 mm, 130 pages, ill., graph., bibl.
ISBN : 0-908136-72-2.
Subject(s) : identification, production, construction, design, specification, protection, promotion.
Technique(s) : adobe, rammed earth, compressed blocks.
- 014 **Building Technology Series. Building materials and Construction Technologies for Low-Cost Housing in Developing ESCAP Countries.**
Mukerji K., Mathur G.C.
ESCAP/UNCHS, Bangkok, Thailand, 1987.
Booklet : 210 x 297 mm, 50 pages, ill., graph., bibl.
Subject(s) : identification, stabilization, production, construction, design, promotion.
Technique(s) : rammed earth, compressed blocks, other.
- 015 * **Building with earth.**
CRATerre : Doat P., Hays A., Houben H., Matuk S., Vitoux F.
The Mud Village Society, New Delhi, India, 1990.
Book : 180 x 255 mm, 287 pages, ill., tab., graph., bibl.
Subject(s) : building with earth, earth, identification, stabilization, characterization, production, construction, design, disaster mitigation, specification, protection, vocabulary, bibliography.
Technique(s) : multiple.
- 016 **Building with earth. A handbook.**
Norton J.
IT Publications, London, United Kingdom, 1986.
Manual : 210 x 297 mm, 68 pages, ill., graph., bibl.
ISBN : 0 946688 33 8.
Subject(s) : building with earth, earth, identification, stabilization, characterization, construction, design, protection.
Technique(s) : adobe, rammed earth, compressed blocks, wattle and daub.
- 017 **Choice of technology and design options. Rural demonstration house. Chumpuang, Thailand.**
Itebeke M., Jacobus P.
PGC-HS-KULeuven, Leuven, Belgium, 1988.
Booklet : 210 x 297 mm, 53 pages, ill.
ISBN : 97-48201-78-3.
Subject(s) : construction, design.
Technique(s) : compressed blocks.
- 018 **Compressed earth blocks.**
In : Building technology series. n° 1.
Mukerji K.
ESCAP, Bangkok, Thailand, 1987.
Booklet : 210 x 297 mm, 4 pages, ill., bibl.
Subject(s) : construction, design.
Technique(s) : compressed blocks.
- 019 **Down to earth. Mud architecture : an old idea, a new future.**
Dethier J.
Thames and Hudson, London, United Kingdom, 1982.
Book : 195 x 240 mm, 192 pages, ill., bibl.
ISBN : 0-500-27277-8.
Subject(s) : building with earth, socio-cultural factors, promotion.
Technique(s) : general.
- 020 **Earth architecture.**
HUDCO, New Delhi, India, 1989.
Book : 220 x 224 mm, 51 pages, ill., tab.
Subject(s) : building with earth, case studies, promotion.
Technique(s) : general.
- 021 **Earth sheltered architecture in China.**
Jing Qimin, Lan Jian, Song Haillang.
Architecture Department of Tianjin University, Tianjin, China, 1985.
Book : 200 x 185 mm, 154 pages, ill.
ISBN : 15212-179.
Subject(s) : building with earth, case studies, socio-cultural factors.
Technique(s) : adobe, rammed earth, dug-out.

- 045 Reinforced soil. 1st edition.**
In : ICONDA bibliography n° 7.
IRB Verlag, Stuttgart, Germany, 1989.
Catalogue : 145 x 210 mm, 110 pages, bibl.
ISBN : 3-8167-3456-1.
Subject(s) : bibliography.
Technique(s) : general.
- 046 Roofing with mud bricks. Mud brick dome and vault constructions : the Maryborough experience.**
In : Documentation series.
Ramesh Manandhar, Allan Roger.
Centre for Applied Research on the Future,
University of Melbourne, Melbourne, Australia,
1987.
Book : 210 x 297 mm, 59 pages, ill., tab., bibl.
ISBN : 0-642-13108-2.
Subject(s) : building with earth, construction.
Technique(s) : adobe, rammed earth, compressed blocks.
- 047 Rural India. Village houses in rammed earth.**
Popposwamy.
Dienste in Übersee, Stuttgart, Germany, 1979.
Book : 175 x 227 mm, 70 pages, ill., graph., bibl.
Subject(s) : construction, design, case studies.
Technique(s) : rammed earth.
- 048 Small-scale manufacture of stabilised soil blocks.**
In : Technology series. Technical memorandum. n° 12.
Smith R.G., Webb D.J.T.
ILO, Genève, Switzerland, 1987.
Book : 210 x 297 mm, 147 pages + annexes, ill., tab., graph., bibl.
ISBN : 92-2-105838-7.
Subject(s) : earth, identification, stabilization, characterization, production, specification, economics, vocabulary.
Technique(s) : compressed blocks.
- 049 * Soil block presses. Product information.**
Mukerji K., CRATerre.
GATE, Eschborn, Germany, 1988.
Catalogue : 210 x 297 mm, 32 pages, ill., bibl.
Subject(s) : production.
Technique(s) : compressed blocks.
- 050 Soil stabilization with hydraulic binders. 1st edition.**
In : ICONDA bibliography n° 6.
IRB Verlag, Stuttgart, Germany, 1989.
Catalogue : 145 x 210 mm, 94 pages, bibl.
ISBN : 3-8167-3455-3.
Subject(s) : bibliography.
Technique(s) : general.
- 051 * Soil-cement technology for low-cost housing in rural Thailand. An evaluation study.**
Itebeke M., Jacobus P.
PG-CHS-KULeuven, Leuven, Belgium, 1988.
Book : 210 x 295 mm, 154 pages + annexes, ill., tab., bibl.
ISBN : 97-43200-53-1.
Subject(s) : earth, identification, stabilization, characterization, production, construction, design, case Studies.
Technique(s) : compressed blocks.
- 052 * Spectacular vernacular. The adobe tradition.**
Bourgeois J.L., Pelos C.
Aperture, New York, USA, 1989.
Book : 230 x 310 mm, 191 pages, ill., bibl.
ISBN : 0-89381-391-5.
Subject(s) : building with earth.
Technique(s) : multiple.
- 053 Stabilized earth construction. An instructional manual.**
Ferm R.
IFEC, Washington, USA, 1985.
Manual : 215 x 280 mm, 63 pages + annexes, ill., bibl.
Subject(s) : identification, stabilization, production.
Technique(s) : adobe.
- 054 * The earthbuilders' encyclopedia.**
Tibbets J.M.
Southwest Solaradobe School, Albuquerque, USA, 1988.
Book : 225 x 298 mm, 196 pages, ill., tab., graph.
ISBN : 0-9621885-0-6.
Subject(s) : vocabulary.
Technique(s) : general.

- 055 The manufacture of asphalt emulsion stabilized soil bricks and brick maker's manual.**
California State University, International Institute of Housing Technology, Fresno, USA, 1972.
Book : 215 x 275 mm, 54 pages + annexes, ill., tab., graph., bibl.
Subject(s) : earth, identification, stabilization, production.
Technique(s) : adobe.
- 056 The rammed earth experience.**
Easton D.
Blue Mountain Press, Wilseyville, USA, 1982.
Book : 215 x 280 mm, 73 pages, ill.
Subject(s) : identification, production, construction, design.
Technique(s) : rammed earth.
- 059 Advancing building technology. Proceedings of the 10th triennial congress of the international council for building research, studies and documentation. Shelter for the homeless in developing countries. 22-26 September 1986, Washington, USA. Vol. 4 of 11.**
CIB 86, Gaithersburg, USA, 1986.
Conference proceedings : 210 x 280 mm, 475 pages, ill., tab., graph.
Subject(s) : case studies, promotion.
Technique(s) : multiple, other.

- 060 Appropriate building materials for low cost housing. Volume 1 et Volume 2. Proceedings of a symposium held in Nairobi, Kenya, from 7 to 14 November 1983.**
CIB, RILEM.
E. & F.N. Spon, London / New York, United Kingdom / USA, 1983.
Conference proceedings : Vol. 1 : 160 x 240 mm, 524 pages, tab., graph. Vol. 2 : 160 x 240 mm, 297 pages, tab., graph.
ISBN : 0-419-13280-5.
Subject(s) : production, protection, case studies.
Technique(s) : multiple, other.

CONFERENCES

- 057 5th international meeting of experts on the conservation of earthen architecture. Proceedings of the international conference. Rome, Italy, 22-23 October 1987.**
CRATerre, EAG : Houben H. ; ICCROM : Alva A.
CRATerre, Villefontaine, France, 1988.
Conference proceedings : 160 x 240 mm, 110 pages, ill., graph.
ISBN : 92-9077-087-2.
Subject(s) : preservation.
Technique(s) : multiple.
- 058 * 6th International conference on the conservation of earthen architecture. Adobe 90 preprints.**
The Getty Conservation Institute, Marina Del Rey, USA, 1990.
Conference proceedings : 210 x 297 mm, 469 pages.
ISBN : 0-89236-181-6.
Subject(s) : building with earth, stabilization, characterization, construction, disaster mitigation, preservation, protection, case studies.
Technique(s) : multiple, adobe, rammed earth, cob, wattle and daub.
- 061 Building materials for low-income housing. Asian and pacific region. Proceedings of a symposium held at the United Nations building in Bangkok, Thailand from 20 to 26 January 1987.**
ESCAP, RILEM, CIB.
SPON E. & F.N., London, United Kingdom, 1987.
Conference proceedings : 160 x 240 mm, 354 pages, tab., ill.
Subject(s) : production, disaster mitigation, case studies.
Technique(s) : compressed blocks, other.
- 062 Conference papers of the international colloquium on "Earth construction technologies appropriate to developing countries". Proceedings of the international colloquium. Brussels, 10-12 December 1984.**
PGC-HS, CRA.
PGC-HS/KUL, CRA/UCL, Leuven, Belgium, 1985.
Conference proceedings : 210 x 297 mm, 423 pages, ill., tab., graph., bibl.
Subject(s) : building with earth, stabilization, characterization, production, construction, design, disaster mitigation, preservation, specification, case studies, socio-cultural factors, promotion.
Technique(s) : general, adobe, rammed earth, compressed blocks, wattle and daub.

- 063** **Earth construction technologies in developing countries. Proceedings of the Arab league seminar on the use of clay in housing construction and new technologies. Tunis, 8-10 September 1986.**
UNCHS, Nairobi, Kenya, 1986.
Conference proceedings : 210 x 297 mm, 24 pages, tab., bibl.
Subject(s) : identification, stabilization, production, protection, promotion.
Technique(s) : adobe, rammed earth, compressed blocks.
- 064** **Earthquake resistant low-cost houses utilizing indigenous building materials and intermediate technology.**
In : International symposium on "Earthquake relief in less industrialized areas". Zurich, March 28-30 1984. p 105 à 108.
Minke G.
SIA, Zurich, Switzerland, 1984.
Conference papers : 210 x 297 mm, 3 pages, ill.
Subject(s) : construction, design, disaster mitigation.
Technique(s) : rammed earth, other.
- 065 *** **Economical housing in developing countries : materials, construction techniques, components. Proceedings of the international conference. Paris, January 25-27, 1983.**
Presses de l'Ecole Nationale des Ponts et Chaussées, Paris, France, 1983.
Conference proceedings : 210 x 297 mm, vol. 1 : 344 pages, vol. 2 : 238 pages.
ISBN : 2-85978-054.
Subject(s) : production.
Technique(s) : multiple, other.
- 066** **Housing. S.F.S.U.'s bulletin. Symposium, February 20th-23rd 1980. CEDUST.**
Faculty of Arts, University of Khartoum, Khartoum, Sudan, 1981.
Conference proceedings : 210 x 297 mm, 170 pages, tab., graph., ill.
Subject(s) : production, case studies.
Technique(s) : compressed blocks, other.
- 067 *** **International workshop earthen buildings in seismic areas. Vol. 1 et Vol. 2 : Conference proceedings. Vol. 3 : Conference report research needs and priorities. Proceedings of the international workshop held at Albuquerque, New Mexico, May 24-28, 1981.**
Gerald W. May.
College of Engineering, University of New Mexico, Albuquerque, USA, 1981.
Conference proceedings : Vol. 1 : 215 x 275 mm, 693 pages, ill., tab., graph., bibl. Vol. 2 : 215 x 275 mm, 519 pages, ill., tab., graph., bibl. Vol. 3 : 215 x 275 mm, 34 pages, ill., bibl.
Subject(s) : general, disaster mitigation.
Technique(s) : general.
- 068 *** **Materials, construction techniques and construction economy in developing countries. Proceedings of the international conference, Paris, December 9-10-11, 1986.**
CSTB, Plan Construction, Ecole Nationale des Ponts et Chaussées, Paris, France, 1986.
Conference proceedings : 160 x 240 mm, vol.1 355 pages, vol.2 373 pages.
ISBN : 2-86891-090-4.
Subject(s) : production, economics, case studies.
Technique(s) : multiple, other.
- 069** **Mud architecture. Report on the first interaction on mud architecture organised in New-Delhi by HUDCO in June 1986 and useful technical information.**
Khosla A.
HUDCO, New Delhi, India, 1986.
Conference proceedings : 210 x 260 mm, 18 pages, bibl.
Subject(s) : general, protection, case studies., socio-cultural factors, promotion.
Technique(s) : adobe.
- 070** **Mud mud mud. Proceedings of the international conference on mud architecture. Trivandrum, 25th to 28th November 1987.**
Joseph Alexander K.
HUDCO, Trivandrum, India, 1987.
Conference proceedings : 215 x 265 mm, 49 pages, ill.
Subject(s) : socio-cultural factors, promotion.
Technique(s) : general.

REPORTS

- 071** **Mud mud mud. Technical papers volume. National seminar on application of stabilized mud blocks in housing and building. 26-27, November 1988. Bangalore.**
Jagadish K.S., Suresh V.
ASTRA, HUDCO, Bangalore, India, 1988.
Conference proceedings : 220 x 285 mm, 230 pages + annexes, ill., tab., graph. .
Subject(s) : promotion.
Technique(s) : general.
- 072** **National seminar on "Application of stabilized mud blocks in housing and building". Technical papers. Vol. 2. 26-27, November 1988. Bangalore.**
ASTRA, HUDCO, Bangalore, India, 1988.
Conference proceedings : 220 x 288 mm, 64 pages, ill., tab. .
Subject(s) : promotion.
Technique(s) : general.
- 073 *** **Proceedings of the international colloquium on "Earth construction technologies appropriate to developing countries". Proceedings of the international colloquium. Brussels, Belgium. 10-12 December 1984.**
Liebaert A.
AGCD/ABOS. (Belgian Ministry for Foreign Affairs / Belgian Administration for Development Cooperation), Brussels, Belgium, 1985.
Conference proceedings : 210 x 297 mm, 186 pages, graph.
Subject(s) : promotion.
Technique(s) : general.
- 074** **Proceedings of the international symposium on earth architecture. Proceedings of the symposium. Beijing, 1-4 November 1985.**
The Architectural Society of China, Pékin, China, 1985.
Conference proceedings : 184 x 255 mm, 530 pages, ill., tab., graph.
Subject(s) : building with earth, stabilization, characterization, construction, design, disaster mitigation, case studies, socio-cultural factors, promotion.
Technique(s) : general, dug-out.
- 075** **Workshop on Kenya standards and specifications for soil blocks.**
UNCHS (Habitat), CSC, Nairobi, Kenya, 1989.
Conference proceedings : 210 x 297 mm, 4 pages + annexes.
Subject(s) : promotion.
Technique(s) : compressed blocks.
- 076** **A low cost housing system for Guatemala.**
In : Schriftenreihe der Arbeitsgruppe für Angepasste Technologie. Heft 3.
AGAT.
Gesamthochschule Kassel, Kassel, Germany, 1980.
Report : 210 x 297 mm, 69 pages, ill., tab.
Subject(s) : disaster mitigation.
Technique(s) : other.
- 077** **Adobe for school construction. An interim report on the use of hollow adobe blocks for construction of primary village schools in Ethiopia.**
Mossberg B.
SCMS, Addis-Ababa, Ethiopia, 1988.
Report : 210 x 297 mm, 7 pages, ill., bibl.
Subject(s) : construction, promotion.
Technique(s) : adobe.
- 078** **AL-SERAT. Model village. Ahmed Pur East, Pakistan.**
AL-SERAT Trust, Ahmed Pur East, Pakistan, 1983.
Report : 297 x 210 mm, 92 pages, ill., tab.
Subject(s) : construction, case studies.
Technique(s) : adobe.
- 079** **An examination of mud brick architectural forms in Iran with experimental applications in southwestern United States.**
McHenry G.P.
The University of New Mexico, New Mexico, USA, 1974.
Report : 216 x 279 mm, 166 pages + annexes, ill., tab., bibl.
Subject(s) : building with earth, construction, case studies.
Technique(s) : adobe.
- 080** **An innovative water tank project. Chumpuang, Thailand.**
Itebeke M., Jacobus P.
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Report : 210 x 297 mm, 7 pages, ill., tab., bibl.
Subject(s) : construction, design.
Technique(s) : compressed blocks.

- 081** **Appropriate technology adobe construction. A research and demonstration project on the use of adobe for low-cost housing construction.**
In : CSIR research report. n° BBR 629.
Arrigone J.L.
NBRI, CSIR, Pretoria, South Africa, 1986.
Report : 210 x 297 mm, 22 pages, ill., graph., bibl.
ISBN : 0-7988-3286-X.
Subject(s) : earth, identification, characterization, production, construction.
Technique(s) : adobe.
- 082 *** **Case studies on earth construction : synthesis. Vol. 6.1.**
In : International colloquium on "Earth construction technologies appropriate to developing countries".
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1984.
Report : 210 x 297 mm, 51 pages, tab., bibl. .
Subject(s) : case studies, socio-cultural factors, promotion.
Technique(s) : general.
- 083 *** **Case studies on earth construction : synthesis. Vol. 6.2.**
In : International colloquium on "Earth construction technologies appropriate to developing countries".
Odul P.
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1984.
Report : 210 x 297 mm, 147 pages + annexes, ill., tab., bibl. .
Subject(s) : case studies, socio-cultural factors, promotion.
Technique(s) : general.
- 084 *** **Case studies on earth construction. Vol. 1. Kenya, Zambia.**
In : International colloquium on "Earth construction technologies appropriate to developing countries".
Kateregga J.K.
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1983.
Report : 210 x 297 mm, 161 pages + annexes, ill., tab., bibl. .
Subject(s) : building with earth, production, construction, case studies, socio-cultural factors, promotion.
Technique(s) : adobe, compressed blocks.
- 085 *** **Case studies on earth construction. Vol. 2. China, Thailand.**
In : International colloquium on "Earth construction technologies appropriate to developing countries".
Stevens A., Apers J.
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1983.
Report : 210 x 297 mm, 91 pages + annexes, ill., tab., bibl. .
Subject(s) : building with earth, construction, economics, case studies, socio-cultural factors, promotion.
Technique(s) : adobe, rammed earth, compressed blocks, dug-out.
- 086 *** **Case studies on earth construction. Vol. 3. Mexico, New Mexico.**
In : International colloquium on "Earth construction technologies appropriate to developing countries".
Van Lengen J., Buelens P.
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1984.
Report : 210 x 297 mm, 63 pages, ill., bibl. .
Subject(s) : building with earth, construction, case studies, socio-cultural factors, promotion.
Technique(s) : adobe, shaped earth.
- 087 *** **Case studies on earth construction. Vol. 4. Côte-d'Ivoire, Tunisie.**
In : International colloquium on "Earth construction technologies appropriate to developing countries".
Theunissen Ph., Odul P.
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1983.
Report : 210 x 297 mm, 136 pages + annexes, ill., tab., bibl. .
Subject(s) : building with earth, production, construction, economics, case studies, socio-cultural factors, promotion.
Technique(s) : adobe, compressed blocks, cob, wattle and daub, shaped earth.
- 088 *** **Case studies on earth construction. Vol. 5. Ecuador.**
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Bohorquez T.X.
AGCD/ABOS, UNCHS, PGC-HS, CRA, CRATerre, Louvain-La-Neuve, Belgium, 1983.
Report : 210 x 297 mm, 50 pages + annexes, ill., tab., bibl. .
Subject(s) : building with earth, construction, case studies, socio-cultural factors, promotion.
Technique(s) : adobe, rammed earth, wattle and daub.

- 089** **Co-operation in the African region on technologies and standards for local building materials.**
UNCHS.
UNCHS (Habitat), Nairobi, Kenya, 1990.
Report : 297 x 210 mm, 35 pages + annexes.
ISBN : 92-1-131104-7.
Subject(s) : specification, promotion.
Technique(s) : compressed blocks, other.
- 090** **Compressed earth blocks : selection of production equipment.**
CRATerre : Houben H., Verney P.E., Maini S.
CDI, Brussels, Belgium, 1988.
Report : 210 x 297 mm, 61 pages, ill., tab., graph., bibl.
Subject(s) : production, specification, promotion.
Technique(s) : compressed blocks.
- 091** **Compressive strength of walls built up of mudblocks and soil-cement blocks.**
In : Working report. n° WR 12.
Ophoven P.
BRU, Ministry of Lands Housing and Urban Development, Dar-Es-Salaam, Tanzania, 1977.
Report : 210 x 297 mm, 14 pages + annexes, tab., graph.
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Technique(s) : multiple.

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Subject(s) : building with earth, production, construction, design, protection, case studies, socio-cultural factors, promotion.
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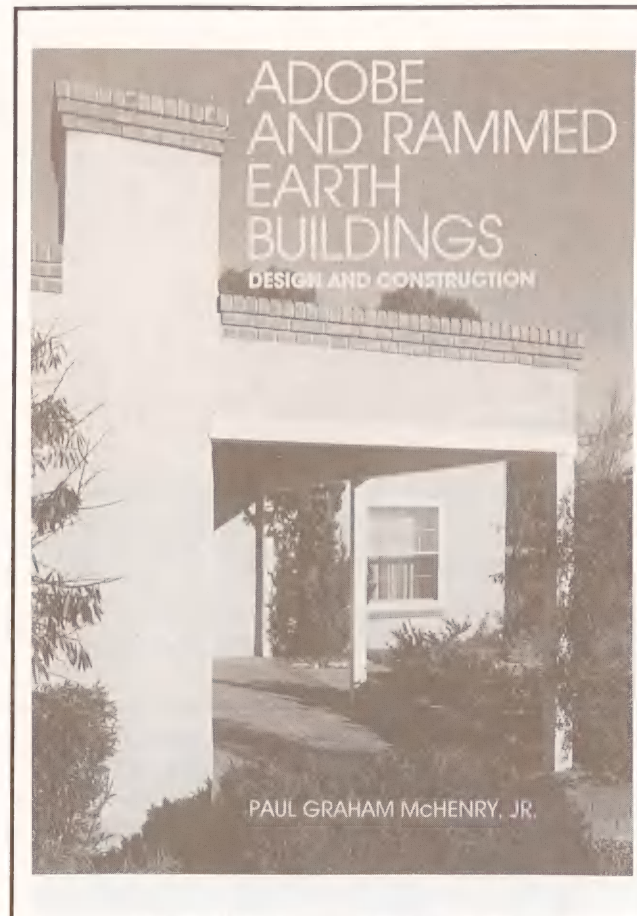
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Adobe and rammed earth buildings. Design and construction.

Wiley-Interscience, New York, USA. 1984. 220 x 285 mm, 205 pages + annexes, ill., tab., graph.
ISBN : 0-8165-1124-1.

Publisher :
The University of Arizona Press
1230 N. Park Avenue, Suite 102
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UNITED-STATES

Chapter titles :

I. History and evolution of earth construction ; II. Examples of earth architecture ; III. Soil selection ; IV. Adobe brick manufacturing ; V. Adobe brick wall construction ; VI. Rammed earth wall construction ; VII. Window and door detailing ; VIII. Earth wall finishes ; IX. Foundations ; X. Floor and roof structures ; XI. Insulation and thermal mass values ; XII. Mechanical considerations ; XIII. Structural engineering for earth buildings ; XIV. Repair and renovation of earth buildings ; XV. Building codes for earth construction ; Appendix ; Index.

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An introduction on the universal nature of building with earth and the richness of the earth heritage is followed by a detailed presentation of all aspects of building with earth, from soil selection to finishings, and including calculations and problems of establishing norms.

Comments :

This document is intended for use in the context of the United States and is not always suited to the problems of developing countries. However, being based on the personal experience and unquestionable skill of the author, it does constitute a reference manual for a builder using sun-dried ("adobe") earth bricks or rammed earth, as it sets out in detail the standard practices for these two techniques. It also provides an interesting overview of the earthen heritage of the United States which is all too often overlooked.

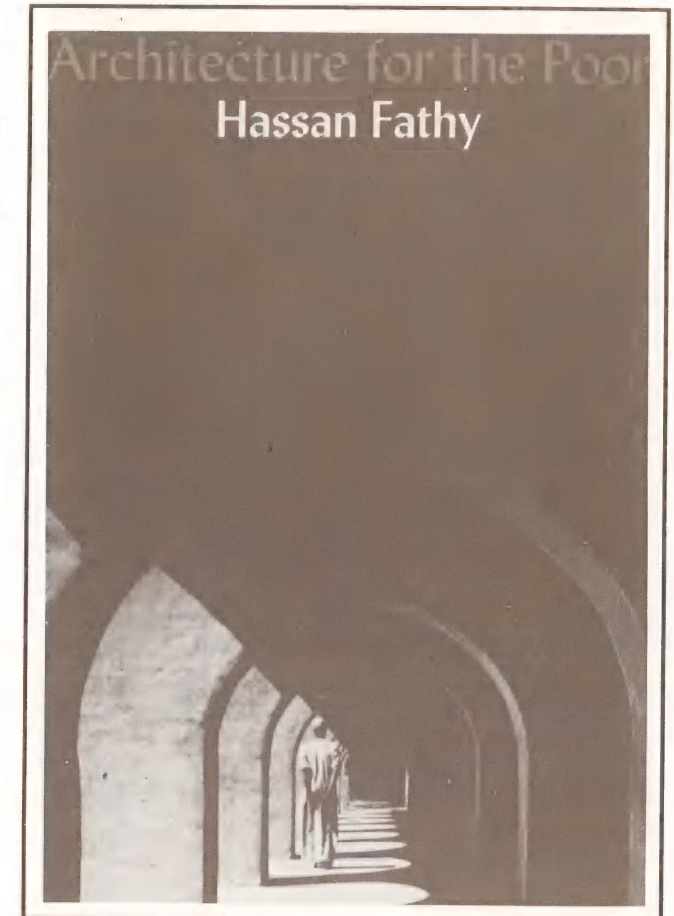
009

Fathy H.

Architecture for the Poor. An experiment in rural Egypt.

The University of Chicago Press, Chicago, USA. 1973. 138 x 228 mm, 194 pages + annexes, ill., tab.
ISBN : 0-226-23915-2.

Publisher :
The University of Chicago Press
USA-Chicago 60637
UNITED-STATES



In French : Construire avec le peuple. Histoire d'un village d'Egypte : Gourna. Editions Jérôme Martineau, Paris, France, 1970. 140 x 225 mm, 194 pages + annexes, ill., tab.

Chapter titles :

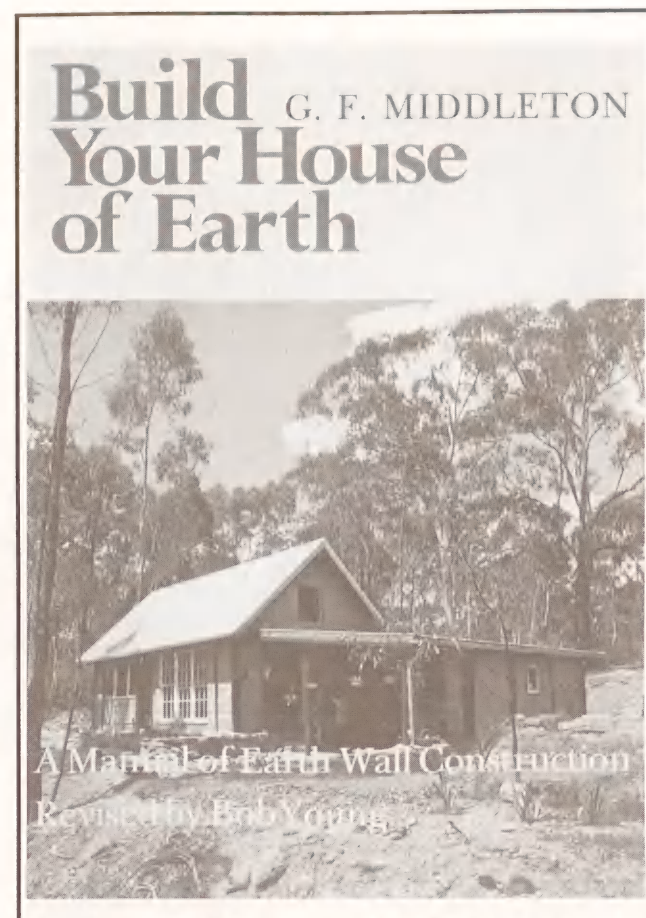
1. Prelude : dream and reality ; 2. Chorale : man, society and technology ; 3. Fugue : architect, peasant and bureaucrat ; Finale : Gourna Dormant ; Appendix I : cost analysis of labor and rates of the execution of works ; Appendix II : in-service training ; Appendix III : organization of work ; Appendix IV : foundation ; Appendix V : brick making ; Appendix VI : cost analysis at the moment when the project was handed over to the Ministry of Social Affairs ; Glossary ; Illustrations.

Description :

This document describes the construction of a village led by the author in the 40s in southern Egypt. Hassan Fathy had on this occasion researched genuinely low-cost solutions and based his programme on the use of sun-dried ("adobe") bricks made on site and on local techniques. This - at the time very original - approach is still a reference for all who are interested in low-cost housing using local materials.

Comments :

Although the operation took place a long time ago and the numerical data is of little use, the approach and above all the reflection which the project engendered are still relevant today. The coherence of the approach adopted by the author remains exemplary.



013

Middleton G.F.

Build your house of earth. A manual of earth wall construction.

Compendium, Victoria, Australia. 1979. 190 x 250 mm, 130 pages, ill., graph., bibl.
ISBN : 0-908136-72-2.

Publisher :
Compendium Pty Ltd
RSD Birregurra South
AUS-Victoria 3242
AUSTRALIA

Chapter titles :

The historical development of earth housing in Australia ; Building your earth house : pisé, adobe, soil-cement ; Conclusion ; Appendixes ; Bibliography ; Index.

Description :

This work is a manual aimed at the self-help builder. It covers the design of earth buildings, as well as materials production and the most common construction techniques in Australia: rammed earth, sun-dried ("adobe") bricks and stabilized compressed earth blocks.

Comments :

Although drawn up in the context of an industrialized country, Australia, a great deal of the information and recommendations are relevant in the context of developing countries as the buildings described are simple and the recommendations in fact describe the state of the art of the techniques used. The manual summarizes the author's own experience and its content is therefore highly practical.

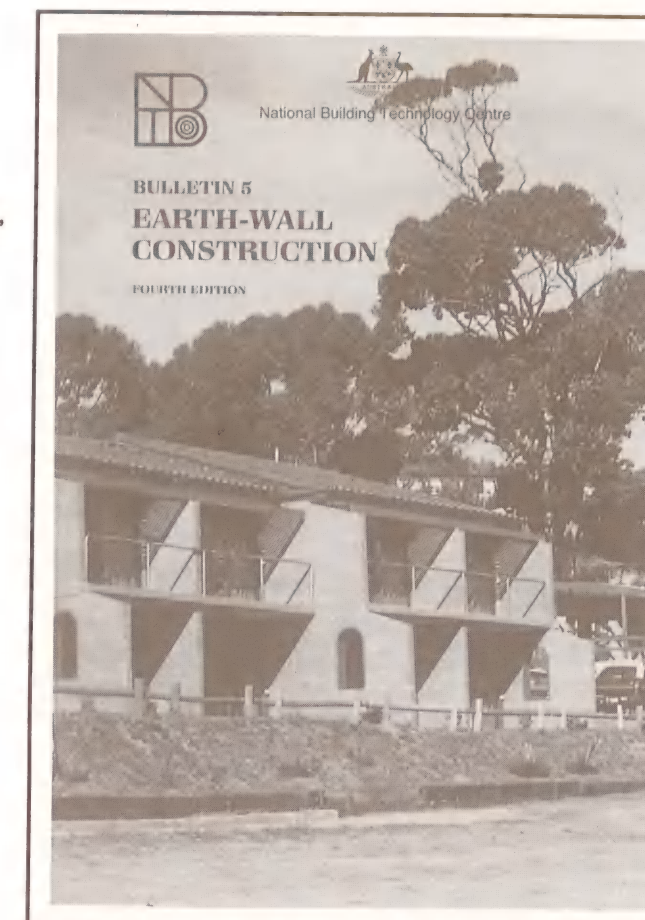
022

Middleton G.F., Schneider L.M.

Earth-wall construction.
In : Bulletin n° 5. Fourth edition.

National Building Technology Centre, Chatswood, Australia. 1987. 175 x 250 mm, 65 pages, ill., tab.
ISBN : 0-642-12289X.

Publisher :
National Building Technology Centre
PO Box 30
AUS-Chatswood 2057
AUSTRALIA

**Chapter titles :**

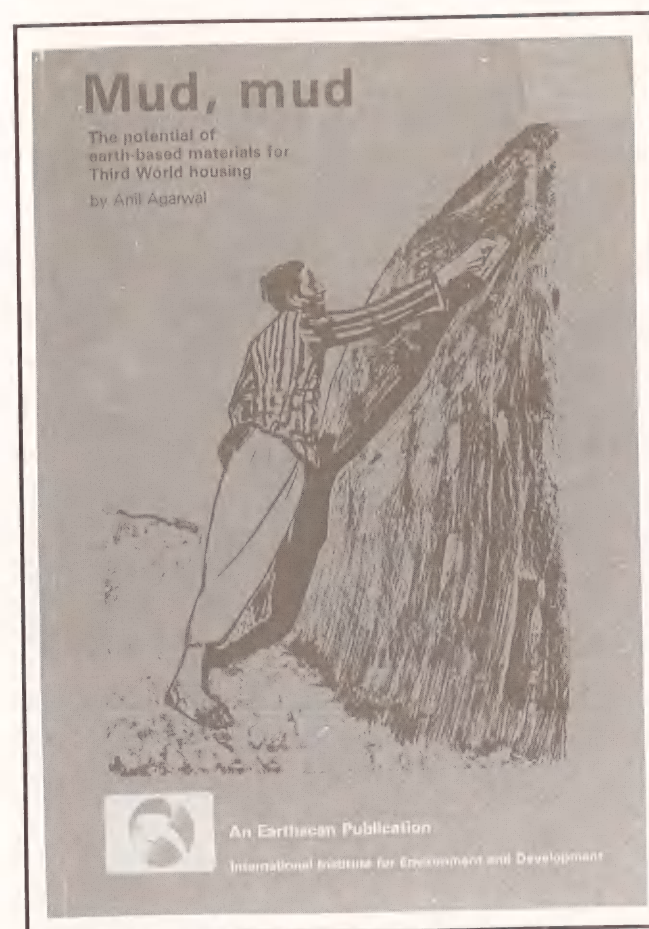
Introduction ; 1. Scope and general ; 2. Selection of soil ; 3. Design criteria ; 4. Rammed-earth (pise) construction ; 5. Mud brick (adobe) construction ; 6. Pressed soil block construction ; Appendix.

Description :

This construction manual focuses on techniques for the use of earth: rammed earth, sun-dried ("adobe") bricks, and the compressed earth block. All aspects are covered, from materials production to finishings. Written in Australia and based on recent constructions, it aims to give the builder all the technical elements necessary to ensure correct building practices.

Comments :

Heavily illustrated and clearly written, this is a useful manual for builders. The fact that it was written in the context of a developed country is no drawback as his insistence on the final quality of the buildings has made the author go into each question in depth. The buildings described are only relatively sophisticated, being mainly simple single-storey houses. The standard practices described are therefore transferable to the context of a number of developing countries.



041, 143, 236

Agarwal A.

Mud, mud. The potential of earth-based materials for Third World housing.

Earthscan, London, United Kingdom. 1981. 145 x 203 mm, 99 pages, ill., tab.
ISBN 0-905347-18-8.

Publisher :
Earthscan
10 Percy Street
GB-London W1P 0DR
UNITED KINGDOM

In French : Bâtir en terre. Le potentiel des matériaux à base de terre pour l'habitat du Tiers Monde. Earthscan, London, United Kingdom. 1981. 145 x 203 mm, 115 pages, ill., tab. ISBN 0-905347-19-6.
In Spanish : Barro, Barro ! Las posibilidades que ofrecen los materiales a base de tierra para la vivienda tercermundista. Earthscan, London, United Kingdom. 1981. 145 x 203 mm, 100 pages, ill., tab. ISBN : 0-905347-20-X.

Chapter titles :

I. Introduction ; II. The housing problem ; III. Building materials ; IV. The case for mud ; V. Country surveys ; VI. Conclusions.

Description :

Focusing on issues of housing in developing countries, this book sets out the inadequacy of many current programmes and attempts to present the potential of earth as a building material to resolve the question. This study is based on the review of numerous cases.

Comments :

This document, which makes the case for earth, is primarily aimed at decision-makers and all who are concerned with housing in developing countries. It presents an overview of the situation with regard to building with earth and housing in a number of typical countries.

Reference :

Simultaneously published in English, French and Spanish.

048

Smith R.G., Webb D.J.T.

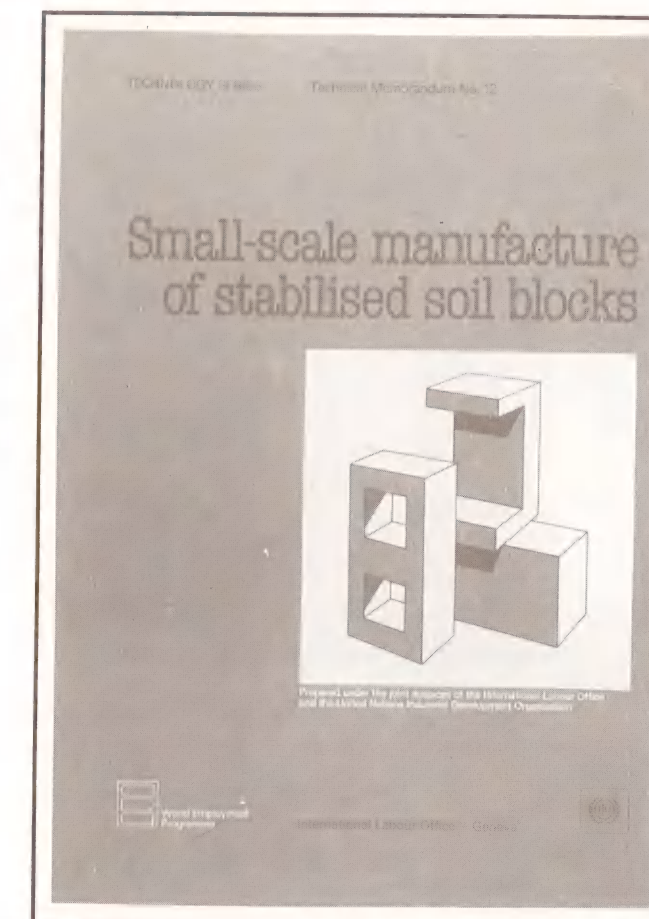
Small-scale manufacture of stabilised soil blocks.

In : Technology series. Technical memorandum. n° 12.

ILO, Geneva, Switzerland. 1987. 210 x 297 mm, 147 pages + annexes, ill., tab., graph., bibl.
ISBN : 92-2-105838-7.

Publisher :
ILO (International Labour Service)
4 route de Morillon
CH-1211 Geneva 22
SWITZERLAND

Price : 90 FF (19 USD)



Chapter titles :

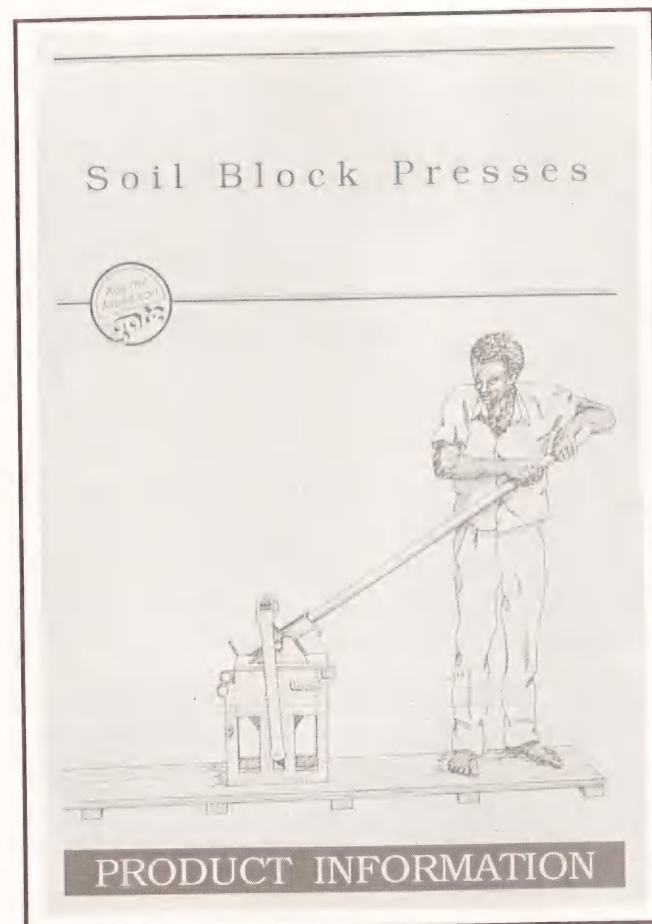
Introduction ; Raw material ; Testing and stabilizers ; Pre-processing of raw material ; Forming ; Curing and testing ; Mortars and renderings ; Costing ; Socio-economic considerations ; Appendixes.

Description :

This is a technical manual on the compressed earth block technique in a workshop context (≈ 400 blocks/day). It covers production stages as well as the choice of mortars and renders to be used when the blocks are laid.

Comments :

This is a synthesis of work done in this area and of the author's own experience. It situates this technique in relation to other building materials and is a good introduction to the technique for decision-makers and building professionals.



049

Mukerji K., CRATerre.

Soil block presses. Product information.

GATE, Eschborn, Germany. 1988. 210 x 297 mm, 32 pages, ill., bibl.

Publisher :
GATE (German Appropriate Technology Exchange)
Dag Hammarskjöld Weg 1-2
Postfach 5180
D- 6236 Eschborn 1
GERMANY

Chapter titles :
Technology ; Equipment ; Criteria for selection and purchase ; Select bibliography ; Product information sheets.

Description :
This document, which consists of a portfolio containing general information, recommendations and a series of descriptive leaflets, aims to provide the potential purchaser with a method for selecting the press most suited to his needs and with information on the existing marketed materials using a standard presentation which allows easy comparison.

Comments :
The potential buyer is often led to make the wrong choice of press, which contributes to the failure of his project, as a result of lack of information. This document has been prepared to meet the constantly renewed demand from technicians and decision-makers involved in the setting-up of CEB projects. For them, this is therefore an invaluable aid.

051

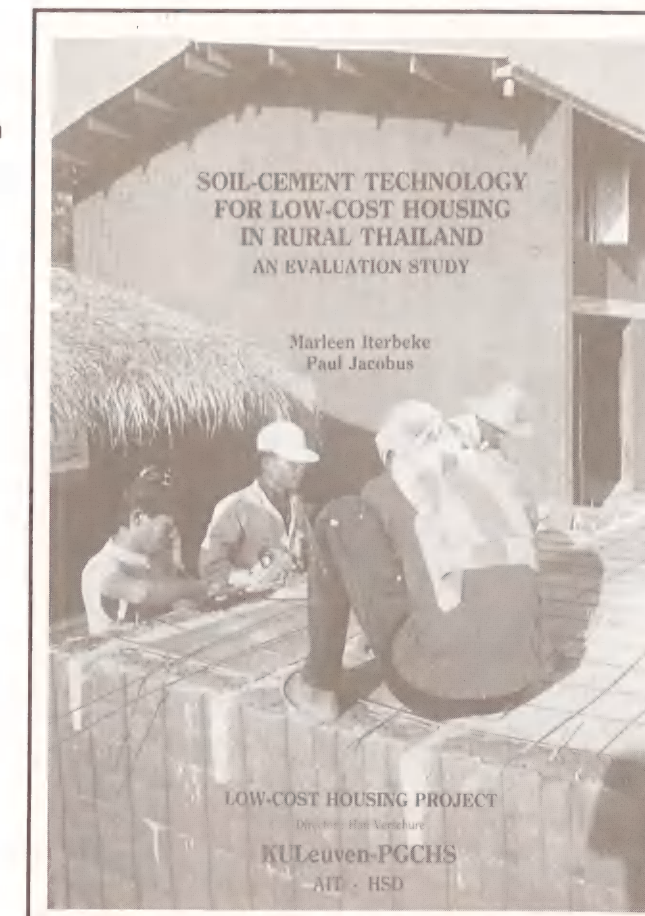
Iterbeke M., Jacobus P.

Soil-cement technology for low-cost housing in rural Thailand. An evaluation study.

PG-CHS-KULeuven, Leuven, Belgium. 1988.
210 x 295 mm, 154 pages + annexes, ill., tab., bibl.
ISBN : 97-43200-53-1.

Publisher :
PGC-HS KULeuven
Kasteel Arenberg
B-3030 Heverlee
BELGIUM

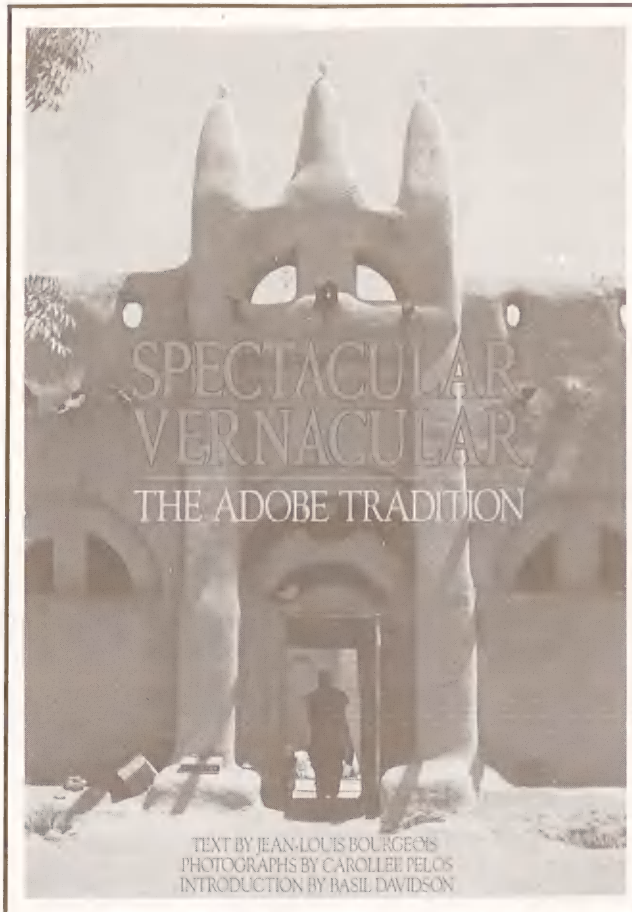
Price : 180 FF (31 USD)



Chapter titles :
I. Preface ; II. Introduction ; III. History and development of soil-cement technology in Thailand ; IV. The characteristics of soil-cement : an alternative building material ; V. Production of soil-cement blocks ; VI. Building with soil-cement blocks ; VII. Conclusions and recommendations ; Annexes.

Description :
This is an extremely detailed study of the development of the technology of the compressed earth block in the context of Thailand, covering its historical, technical and economic development, and providing an overview and an assessment of the priorities for the future of this technique in Thailand.

Comments :
Like all case studies, the conclusions are scarcely transferable, particularly as Thailand has chosen to pursue a very specific technique, that of reinforced masonry with inter-locking CEBs. The approach, however, of the detailed study of a given technology in a given context is of great interest as it highlights all the trends emerging and the problems remaining. From the point of view of its methodology, this is an exemplary document.



052

Bourgeois J.L., Pelos C.

Spectacular vernacular. The adobe tradition.

Aperture, New York, USA. 1989. 230 x 310 mm,
191 pages, ill., bibl.
ISBN : 0-89381-391-5.

Publisher :
Aperture Foundation
20 East 23 street
USA-New York 1010
UNITED-STATES

Chapter titles :

Introduction ; 1. The image of the desert ; 2. Mud in Our Eyes ; 3. Townscapes ; 4. Mud stands up : constructing adobe architecture ; 5. Entrances and households ; 6. The decorated wall ; 7. Roofs ; 8. Wind and ventilation ; 9. Sacred mud : shrines and West African Mosques ; 10. Asking the good and the strong : Afghan Muslim shrines ; 11. Stealing and restoring glory : histories of the Great Mosques of Djenné ; 12. Mud Versus Money : Adobe in Africa, Asia and the US Southwest ; Appendix : Plaster problems : adobe codes in the US Southwest ; Bibliography ; Index.

Description :

Written to complement and accompany the touring exhibition "Spectacular Vernacular", using pictures and text, this book links traditional earth constructions with the cultures from which they spring. The book is a celebration of the beauty, diversity, and efficiency of vernacular architecture.

Comments :

Supported by detailed historical research of both vernacular architecture and the cultural contexts, this book goes beyond a purely esthetic view to restore the strength of the link between culture and architecture. An intelligent appreciation of earth architecture.

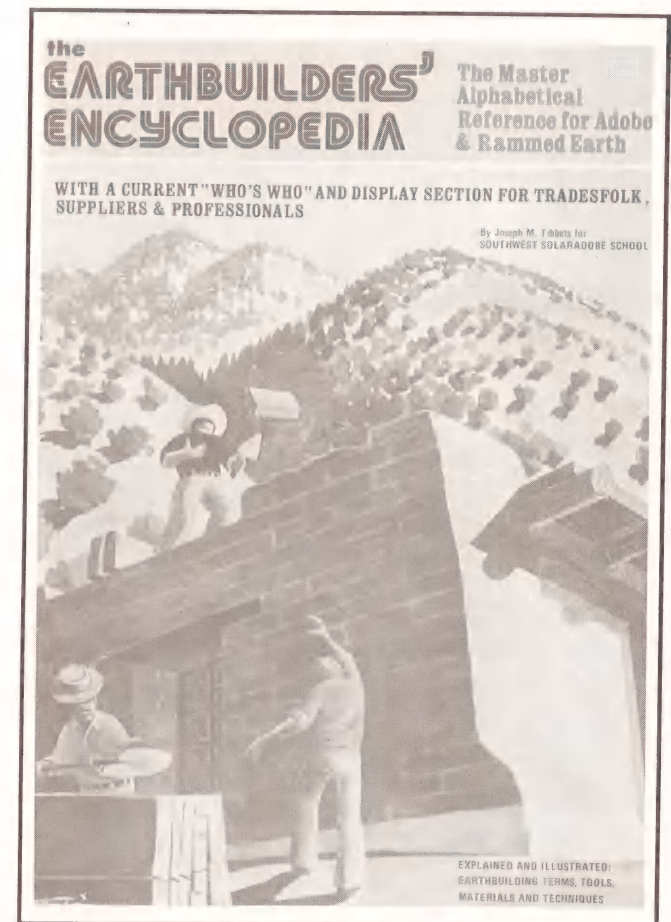
054

Tibbets J.M.

The earthbuilders' encyclopedia.

Southwest Solaradobe School, Albuquerque, USA. 1988.
225 x 298 mm, 196 pages, ill., tab., graph.
ISBN : 0-9621885-0-6

Publisher :
Southwest Solaradobe School
Sabinal Research Station
PO Box 153
USA-Bosque, New Mexico 87006
UNITED-STATES

**Chapter titles :**

Alphabetical encyclopedia ; Earth builders directory ; Display section.

Description :

This lavishly illustrated encyclopedia focuses on techniques for sun-dried ("adobe") bricks and rammed earth. Thanks to its description of technical terms, a detailed description of the techniques, variations and building or particular production methods emerges.

Comments :

Produced in and for the southern United States, the content of this encyclopedia goes beyond its objectives and provides a very rich fund of information for all builders, each of whom will find in the variations or building methods described a solution to his particular problem. The most sophisticated production and application techniques are of course described, alongside, however, traditional techniques which are still frequently used.

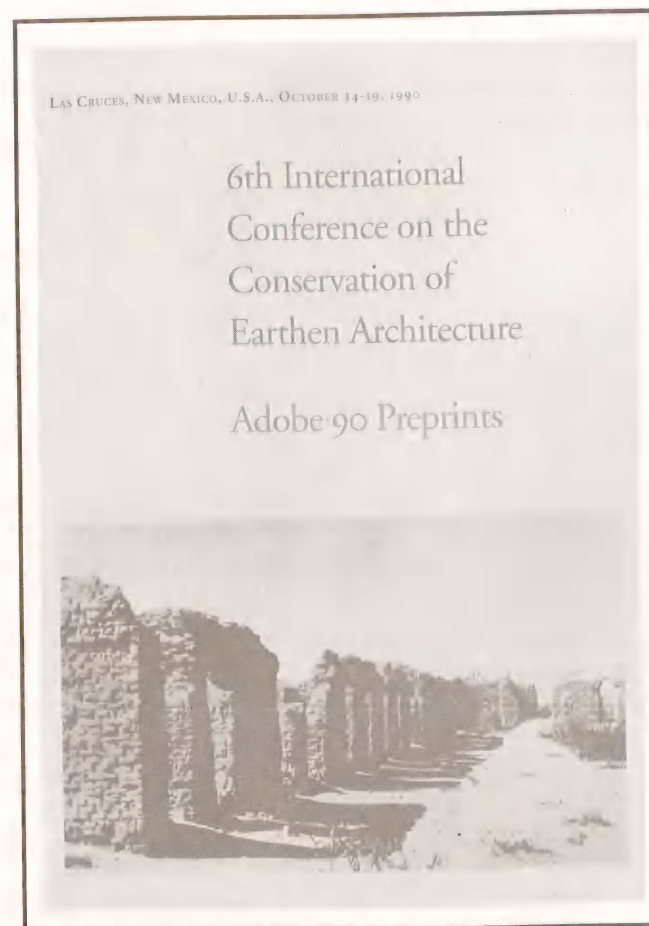
CONFERENCES

058

6th International conference on the conservation of earthen architecture. Adobe 90 preprints.

The Getty Conservation Institute, Marina Del Rey, USA. 1990. 210 x 297 mm, 469 pages.
ISBN : 0-89236-181-6.

Publisher :
The Getty Conservation Institute
4503 Glencoe Avenue
USA-Marina Del Rey, California 90292-6537
UNITED-STATES

**Chapter titles :**

Introduction ; History and restoration ; Site preservation ; Consolidation studies ; seismic mitigation ; current field research ; Problems of moisture ; Clay chemistry and microstructure ; Future directions ; Index.

Description :

Since 1972, there has been a concentrated effort to preserve historic earth monuments. This effort has manifested itself in research programmes and in periodic international conferences enabling professionals from all five continents to exchange ideas and present their work. These conferences have been increasingly successful, witness the number of participants and the quality of the papers presented. Adobe 90 is the most recent of these conferences and gave rise to numerous papers on technical, historical and strategic aspects of the conservation of earth monuments.

Comments :

Despite appearances, work undertaken in programmes for the conservation of earth monuments often has much in common with modern applications of building with earth. Studies of traditional skills allow standard practices to be drawn up, studies on consolidation are not dissimilar to those on stabilization and the study of remedial action allows the definition, by default, of standard practices for building with earth in the past and for the future. This is therefore an extremely rich source of information for technicians, engineers, and designers.

067

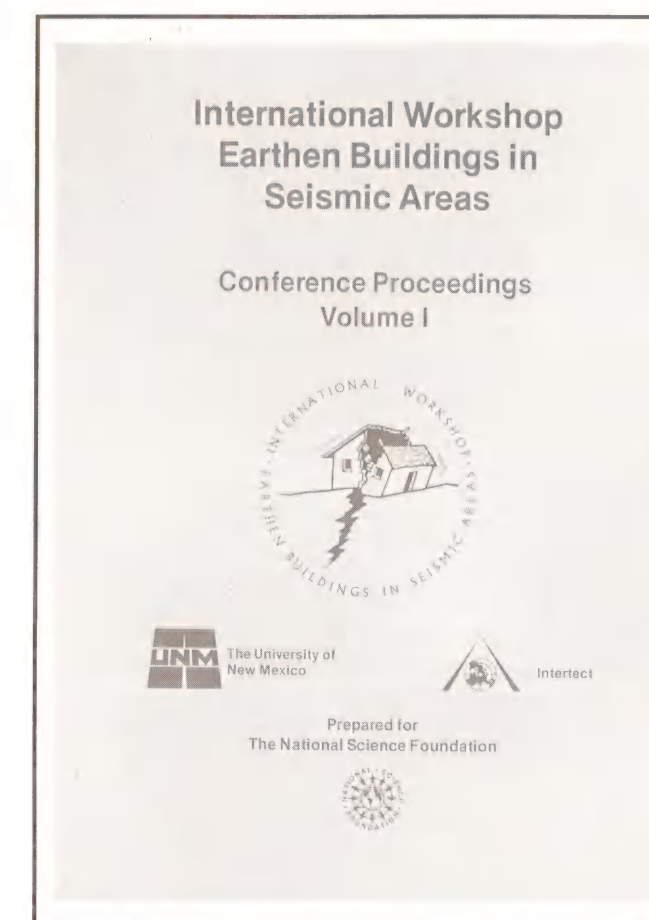
Gerald W. May.

International workshop earthen buildings in seismic areas. Vol. 1 et Vol. 2 : Conference proceedings. Vol. 3 : Conference report research needs and priorities. Proceedings of the international workshop held at Albuquerque, New Mexico, May 24-28, 1981.

Proceedings of the international workshop held at Albuquerque, New Mexico, May 24-28, 1981.

College of Engineering, University of New Mexico, Albuquerque, USA. 1981. 215 x 275 mm, 693 pages, ill., tab., graph., bibl. , Vol. 2, Vol. 3.

Publisher :
The University of New Mexico
457 Washington SE, Suite M
USA-Albuquerque, New Mexico 87108
UNITED-STATES

**Chapter titles :**

Vol. 1 : Structures ; Materials.

Vol.2 : Social, economic and cultural aspects ; Implementation ; Codes, specifications and standards.

Description :

This symposium brought together specialists from most of the earthquake regions of the world and enabled an exchange of ideas from the technical angle, but also on all other aspects relevant to building with earth in these areas.

Comments :

Most aspects of the problem were covered by the large number of widely-differing papers. The diverse nationalities of the participants thus enables the current state of research to be pinpointed.



065, 169, 252

L'habitat économique dans les pays en développement : matériaux, techniques de construction, composants. Comptes-rendus du colloque international Paris, 25-27 janvier 1983.

Economical housing in developing countries : materials, construction techniques, components. Proceedings of the international conference Paris, January 25-27, 1983.

La vivienda económica en los países en desarrollo : materiales, técnicas de construcción, componentes. Actas del coloquio internacional Paris, 25-27 de enero de 1983.

Presses de l'Ecole Nationale des Ponts et Chaussées, Paris, France. 1983. 210 x 297 mm, vol. 1 : 344 pages, vol. 2 : 238 pages.
ISBN : 2-85978-054-8.

Publisher :
Presses de l'Ecole Nationale des Ponts et Chaussées
28 rue des Saints-Pères
F- 75007 Paris
FRANCE

Price : 550 FF (114 USD)

Chapter titles :

Volume 1 / Session 1 : Le matériau terre - Earth as a material - Tierra como material ; Session 2 : Matériaux celluloseux - Cellulosic materials - Materiales celulosicos ; Session 3 : Béton - Concrete - Hormigon ; Session 4 : Les liants - Binders - Los materiales aglutinantes ; Session 5 : Autres matériaux - Other materials - Otros materiales ; Session 6 : Assainissement - Sewerage-Sanitation - Saneamiento ; Session 7 : Résistance aux désastres - Disasters resistance - Resistancia a las catástrofes. Conclusions - Conclusiones.
Volume 2 / Présentation des travaux du colloque - Presentation of the work of the conference - Presentacion de los trabajos del coloquio ; By session : Rapport général - General report - Relato general ; Discussion ; Conclusions - Conclusiones.

Description :

The purpose of the Conference was:

- to focus attention on the recent operational techniques which have passed the stage of experimental realization and which can be developed on a large scale ;
- to draw up an overall picture of the research carried out presently throughout the world, and analyze it from the following angles ;
- optimum utilization of local resources (labour, mineral and vegetable resources, agricultural or industrial residues) in the contribution of the housing sector to economic development ;
- energy and imported raw materials' saving ;
- impact on the environment ;
- to enable scientists and operators to compare ideas and exchange experiences.

Comments :

Numerous papers were presented at this conference, and a genuine exchange of different points of view took place between participants coming from sometimes widely differing standpoints. Although the symposium was not exclusively focussed on earth, the content of several sections was indirectly relevant: cementitious binders, disaster-mitigation, etc.

068, 171, 253

Matériaux, techniques et économie de la construction dans les pays en développement. Compte-rendus du colloque international, Paris 9-10-11 décembre 1986.

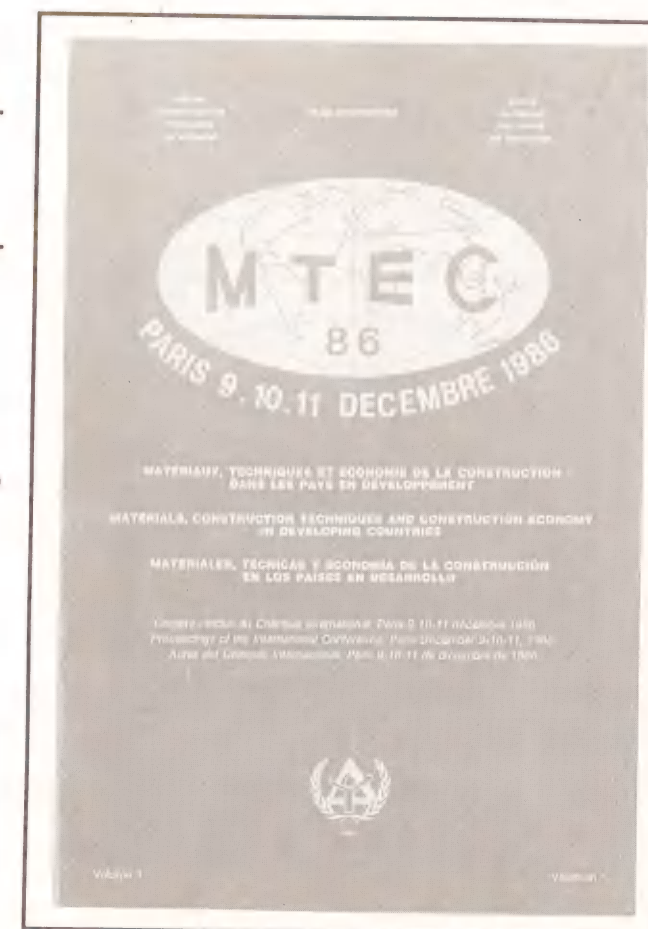
Materials, construction techniques and construction economy in developing countries. Proceedings of the international conference, Paris December 9-10-11, 1986.

Materiales, técnicas y economía de la construcción en los países en desarrollo. Actas del coloquio internacional, Paris 9-10-11 de diciembre de 1986.

CSTB, Plan Construction, ENPC, Paris, France. 1986. 160 x 240 mm, vol.1 : 355 pages, vol.2 : 373 pages.
ISBN : 2-86891-090-4.

Publisher :
CSTB (Centre Scientifique et Technique du Bâtiment)
4 avenue du recteur Poincaré
F- 75782 Paris Cedex 16
FRANCE

Price : 700 FF (145 USD)

**Chapter titles :**

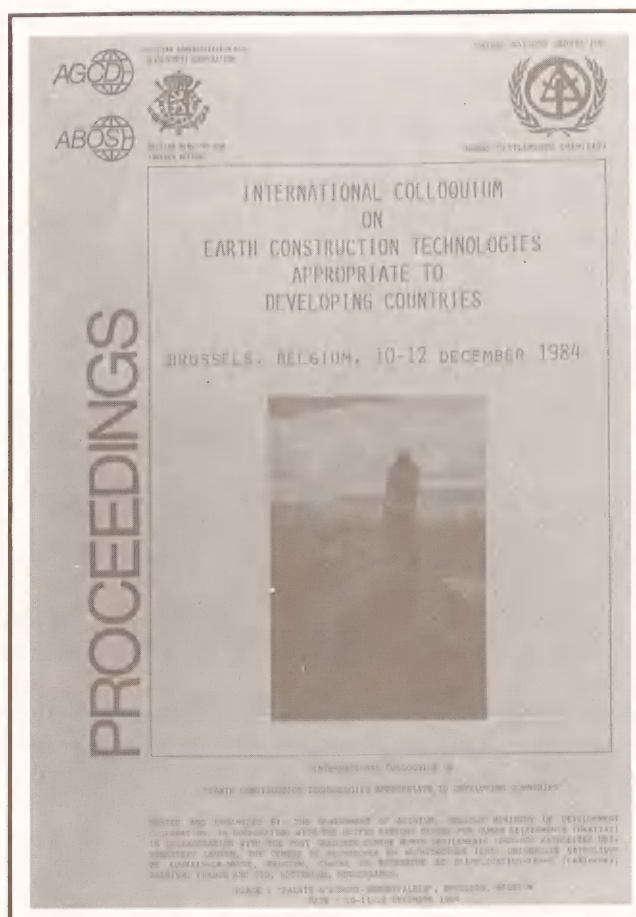
Volume 1 : Communication - Paper - Comunicaciones
Session 1 : Economie de la production des matériaux et composants - Economy of materials and components production - Economia de la producción de materiales y componentes ; Session 2 : Economie de la construction urbaine - Economy of urban construction - Economica de la construcción urbana ; Session 3 : Matériaux et techniques pour la construction des murs - Materials and techniques for wall construction - Materiales y técnicas para la construcción de muros ; Session 4 : Matériaux et techniques pour la construction des toitures et systèmes complets ; Materials and techniques for roofing construction and integral building systems ; Materiales y técnicas para la construcción de techos y sistemas completos.
Volume 2 : Allocutions et discussions - Allocutions and discussions - Alocuciones y discusiones.

Description :

The international MTEC'86 conference was decided on at the close of the MTC conference which, in January 1983 in Paris (UNESCO), attracted more than 400 participants from 45 countries. MTEC'86 aimed at summing up the efforts initiated since then, as far as low-cost building was concerned. There were two main objectives : • to give a technical and economic assessment of the building sector and the building materials' industries in developing countries (sessions 1 and 2) ; • to sum up the materials and building techniques which have gone through the laboratory stage and which have developed in a significant way in urban and peri-urban contexts (sessions 3 and 4). This exchange of information allowed technicians, economists and operators to synthesize all available knowledge, on the eve of the International Year of Shelter for the Homeless (1987).

Comments :

This is a useful work, not only because of the varied nature of the papers, but also because of the level of the discussions which followed. The latter provided a report on trends, progress and obstacles in the low-cost housing sector. The debates on the relationship between the various technologies and the building sector considered to be low-cost are of particular interest to all decision-makers responsible for industrial or building programmes.



073, 082, 083, 084, 085, 086, 087, 088

Liebaert A.

Proceedings of the International colloquium on "Earth construction technologies appropriate to developing countries". Proceedings of the international colloquium. Brussels, Belgium. 10-12 December 1984.

AGCD/ABOS, Bruxelles, Belgium. 1985. 210 x 297 mm, 186 pages, graph.

Publisher :
AGCD (Belgian Administration for Development Cooperation)
Place du champs de Mars, 5
Box 57
B-1050 Brussels
BELGIUM

Chapter titles :

Proceedings of the colloquium : opening ; introductory ; conclusions.

Vol. 1 : Case studies on earth construction, Kenya, Zambia. Vol. 2 : Case studies on earth construction, China, Thailand. Vol. 3 : Case studies on earth construction, Mexico, New Mexico. Vol. 4 : Case studies on earth construction, Ivory Coast, Tunisia. Vol. 5 : Case studies on earth construction, Ecuador. Vol. 6.1 : Case studies on earth construction, Synthesis. Vol. 6.2 : Case studies on earth construction, Synthesis.

Description :

This symposium is of undoubted importance in the field of the modern relevance of building with earth in the 80s. The documents produced on this occasion covered not only papers and discussions but also a series of case studies by country and a manual for building with earth.

Comments :

This symposium went further than the normal framework for the presentation of papers to achieve a reasoned assessment of the state of the art of earth building techniques in several countries and also produced a manual on building with earth which remains to this day the most complete document in English.

PERIODICALS

116

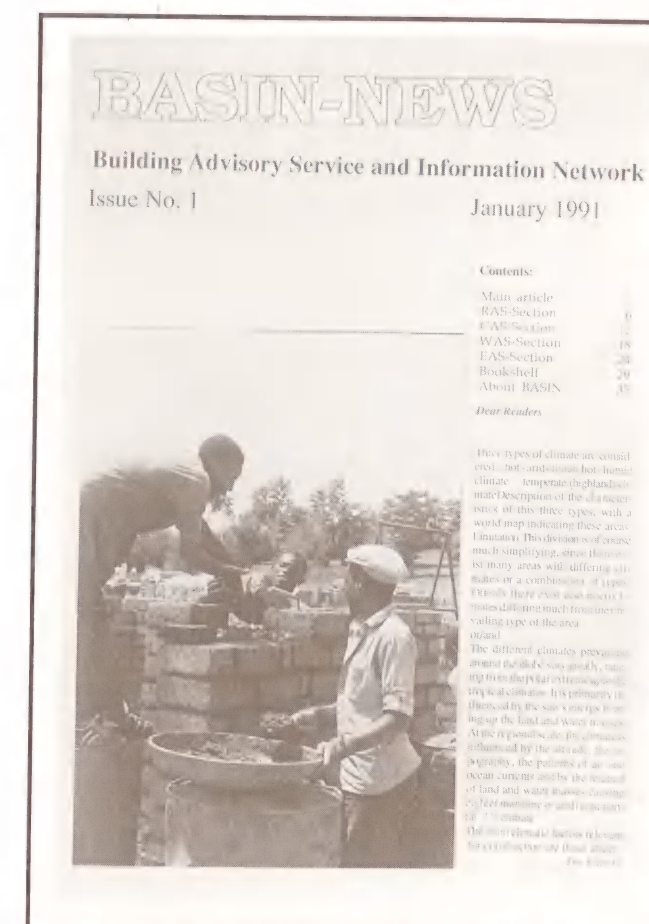
GATE, ITDG, SKAT, CRATerre.

BASIN-News. Building Advisory Service and Information Network.

SKAT-Publications Department, Saint Gallen, Switzerland, 1991.
297 x 210 mm, 30 pages, ill., graph.

Publisher :
SKAT (Swiss Centre for Appropriate Technology)
Tigerbergstrasse 2
CH- 9000 Saint Gallen
SUISSE

Published since 1991.
Biannual.

**Description :**

This bulletin, which is drawn up by the technical information network of BASIN, is divided into four parts, each written by a specialized advisory service of BASIN: masonry and wall-building materials (WAS), cementitious binders (CAS), earth building materials (EAS), roofing materials (RAS). It contains technical articles, current information, basic articles and presents recent documents.

Comments :

BASIN is a network for the dissemination of information on building problems in developing countries. This review therefore addresses technicians, engineers, and designers involved in this field. It provides them with technical information and a means to keep informed of current developments.



120

Solar Earthbuilder International's.

**Solar Earthbuilder International's.
Earth & Sun.**

Solar Earthbuilder International's, Las Cruces, New Mexico, USA. 275 x 215 mm, 24 pages, ill., graph.
ISSN : 0893-3324.

Publisher :
Solar Earth Builder International 's Earth and Sun
PO Box 16119
USA-Las Cruces, New Mexico 88004-6119
UNITED STATES

Published since 1974
Quarterly.

Price : 24 FF (5 USD)

Description :

This journal, which is distributed in the south-west of the United States, focuses on building with sun-dried ("adobe") bricks and on rammed earth, and the use of solar energy. It is aimed at all the actors in the cycle: builders, self-help builders, entrepreneurs, and producers of materials and machinery. It contains technical articles and above all many case studies of completed buildings.

Comments :

Highly influenced by the context in which it is published, this will be of interest to anyone concerned with the industrialization of production techniques. It also contains technical articles on current research work, on issues relating to the establishment of norms which will be of interest to professionals whatever the context in which they are working.

121

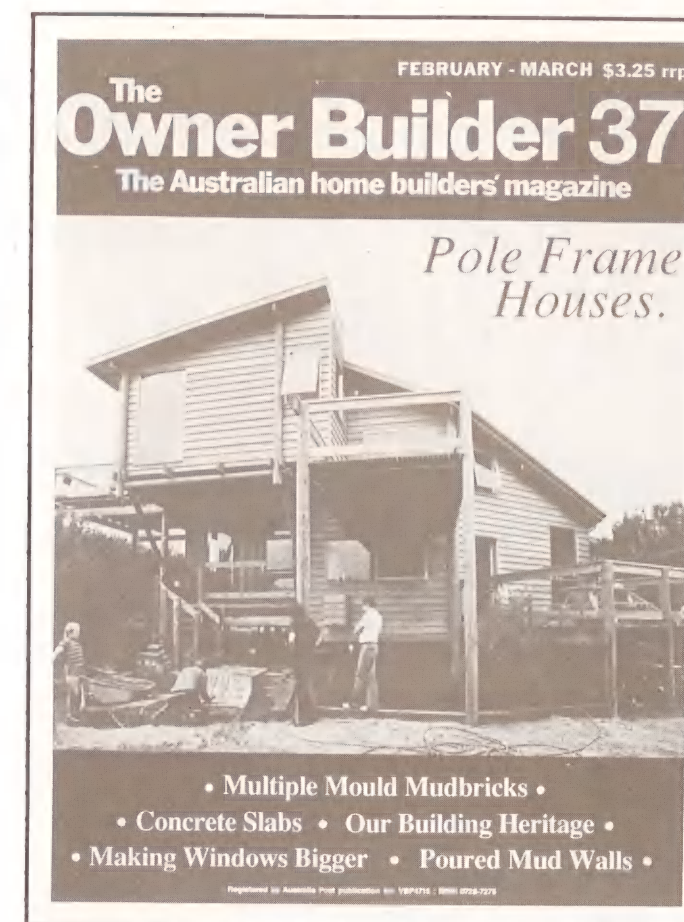
The Owner Builder magazine.

Valerie & Russel Andrews, Bendigo, Australia.
270 x 210 mm, 60 pages, ill., graph.
ISSN : 0728-7275.

Publisher :
The Owner Builder Magazine
PO Box 974
AU-Bendigo
AUSTRALIA

Published since 1981
Quarterly.

Price : 12 FF (3 USD)

**Description :**

Published in Australia for self-help builders, this is a collection of studies of self-help buildings and articles on technical problems. Most of the buildings concerned are in sun-dried ("adobe") bricks or rammed earth.

Comments :

Being published in the context of an industrialized country, this review is not particularly concerned with low-cost housing nor the management of construction programmes. But it does provide inspiration for designer and builder alike, given the diversity of the technical solutions and building tips presented.

DOCUMENTS IN FRENCH



BOOKS

140

Dethier J.

Architectures de terre ou l'avenir d'une tradition millénaire.

Editions du Centre Georges Pompidou, Paris, France. 1986. 210 x 297 mm, 224 pages, ill., bibl. ISBN : 2-85850-326-5.

Publisher :
Centre Georges Pompidou
19 rue Beaubourg
F- 75004 Paris
FRANCE

Price : 180 FF (37 USD)

In German : Lehmarchitektur. Die Zukunft einer Vergessenen Bautradition. Prestel Verlag, Munchen, Germany. 1983. 220 x 270 mm, 216 pages.

In English : Down to earth. Mud architecture : an old idea, a new future. Thames and Hudson, London, United-Kingdom. 1982. 200 x 240 mm, 192 pages.

In American : Adobe architecture : an old idea, a new future. Facts on File (460 Park AV.), New York. 1982. 200 x 240 mm, 192 pages.

In Portuguese : Arquitetura de terra, ou o futuro de uma tradição milenária. Avenir Editoria, Rio de Janeiro, Brazil. 1984. 200 x 240 mm, 208 pages. (A supplement chapter on earth architecture in Brazil).

In Italian : Architettura di terra. Electa, Milano, Italia. 1982. 220 x 240 mm, 192 pages.

In Spanish : Las arquitecturas de tierra, o el porvenir de una tradición milenaria. Museo de artes contemporaneas, Caracas, Venezuela. 1985. 230 x 290 mm, 92 pages. (Abridge edition. A supplement chapter on earth architecture in Venezuela). Museo nacional de antropologia, Mexico, Mexico. 1985. 230 x 290 mm, 92 pages.



Chapter titles :

I. Atouts et enjeux ; II. Traditions ; III. Modernités.

Description :

This work was intended to accompany the exhibition "Down to Earth" held in 1981 at the George Pompidou Centre in Paris and which has since toured numerous countries. It therefore contains the most striking images of the exhibition, but with an accompanying text which alone provides a very pertinent reflection on the past and the future of building with earth.

Comments :

Like the exhibition it accompanied, this is a beautiful book, but more than that its content goes beyond the plastic, esthetic aspects of the materials to shed light on the cultural, technical, economic and social angles. It is a common reference book for professionals working with earth building as it shows the richness of the earth heritage of local cultures without attempting to classify them, but rather drawing attention to their continuity; it also constitutes a powerful argument for the contemporary relevance of building with earth.

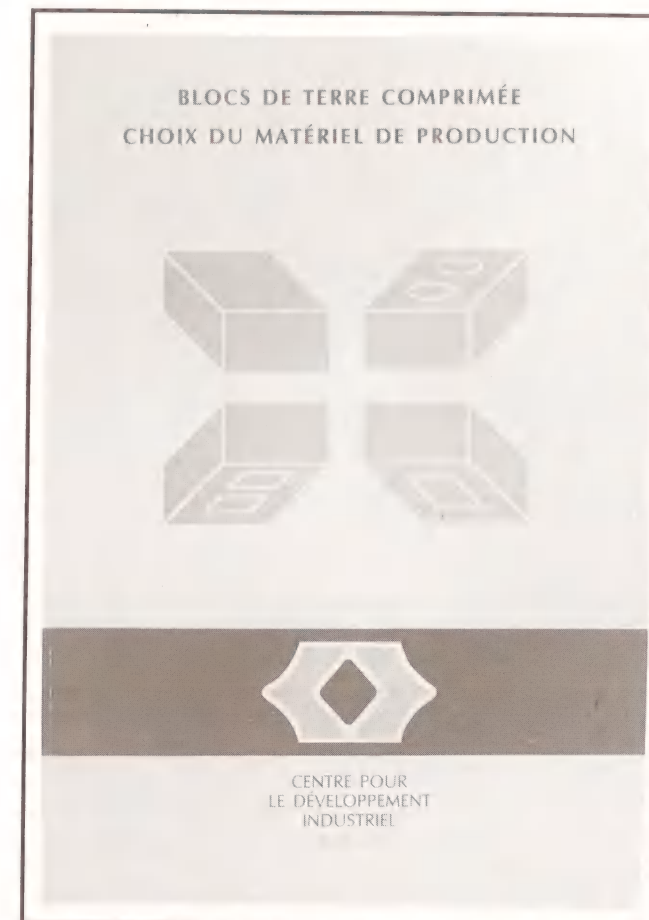
090, 145

CRATerre : Houben H., Verney P.E.

Blocs de terre comprimée : choix du matériel de production.

CDI, Bruxelles, Belgium. 1988. 210 x 297 mm, 61 pages, ill., tab., graph., bibl.

Publisher :
CDI (Centre pour le Développement Industriel)
Rue de l'Industrie, 28
B-1040 Brussels
BELGIUM



In English : Compressed earth blocks : selection of production equipment. CDI, Bruxelles, 1988. 210 x 297 mm, 61 pages, ill., tab., graph., bibl.

Chapter titles :

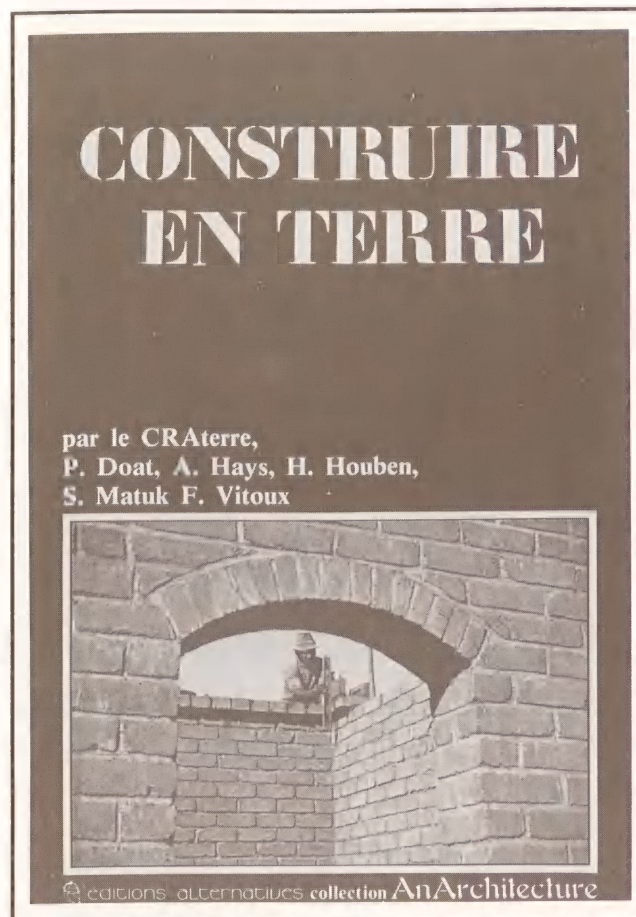
1. Construction en terre ; 2. Blocs de terre comprimée ; 3. Matériel de production ; 4. Choix du matériel de production ; Annexe I : questionnaire ; Annexe II : offre de services ; Annexe III : bibliographie.

Description :

This document consists of three parts: a presentation of the production technology for compressed earth blocks; a method aimed at the potential buyer for evaluating the suitability of a given piece of equipment for his particular project; and an inventory of equipment on the market in EEC countries.

Comments :

This is a useful work in the context of the setting-up of a project based on the use or the production of the CEB. It allows objective decision-taking in relation to the project context. It also allows the diversity of the equipment available for the technique to be appreciated, from the workshop press to industrial production units.



015, 148

CRATerre : Doat P., Hays A., Houben H., Matuk S., Vitoux F.

Construire en terre.

Editions Alternatives, Paris, France. 1985. 80 x 255 mm, 287 pages, ill., tab., graph., bibl.
ISBN : 2-86-227-009-1.

Publisher :
Editions Alternatives
6 rue Montmartre
BP 3301
F- 75001 Paris
FRANCE

Price : 105 FF (22 USD)

In English : CRATerre : Doat P., Hays A., Houben H., Matuk S., Vitoux F. **Building with Earth.** The Mud Village Society ; New Delhi ; India. 1990. 180 x 255 mm, 287 pages, ill., tab., graph., bibl.
In Spanish : CRATerre : Doat P., Hays A., Houben H., Matuk S., Vitoux F. **Construir con Tierra.** Enda - Fedevivienda - Dimensión Educativa ; Bogotá ; Colombie. 1990. 160 x 240 mm, Tome I : 221 pages, Tome II : 259 pages, ill., tab., graph., bibl.

Chapter titles :

Introduction ; I. Le pisé ; II. Façonnage direct et bauge ; III. L'adobe ; IV. Briques de terre compressée ; V. Analyse des sols ; VI. Caractéristiques du matériau terre ; VII. Stabilisation ; VIII. Techniques mixtes ; IX. Toitures en terre ; X. Enduits et peintures ; XI. Les malaxeurs ; Du nouveau au CRATerre ; Construire en terre au Pérou ; Glossaire ; Organismes ; Bibliographie.

Description :

This book is both an introduction to earth architecture and techniques for building with earth and a practical manual on using earth as a building material. It covers the main techniques for using earth and their application in a wide range of contexts.

Comments :

Although recent publications go further than this work, it remains a practical and attractive aid for approaching building with earth from the professional angle. It demonstrates the richness of the earth heritage, as well the modernity of the material and the universality of its use.

158

CRATerre : Guillaud H.

Modernité de l'architecture de terre en Afrique. Réalisations des années 80.

CRATerre, Grenoble, France. 1989. 160 x 240 mm, 180 pages, ill.
ISBN : 2-906901-04-0.

Publisher :
CRATerre
Centre Simone Signoret
BP 53
F- 38090 Villefontaine
FRANCE

Price : 120 FF (25 USD)



Chapter titles :

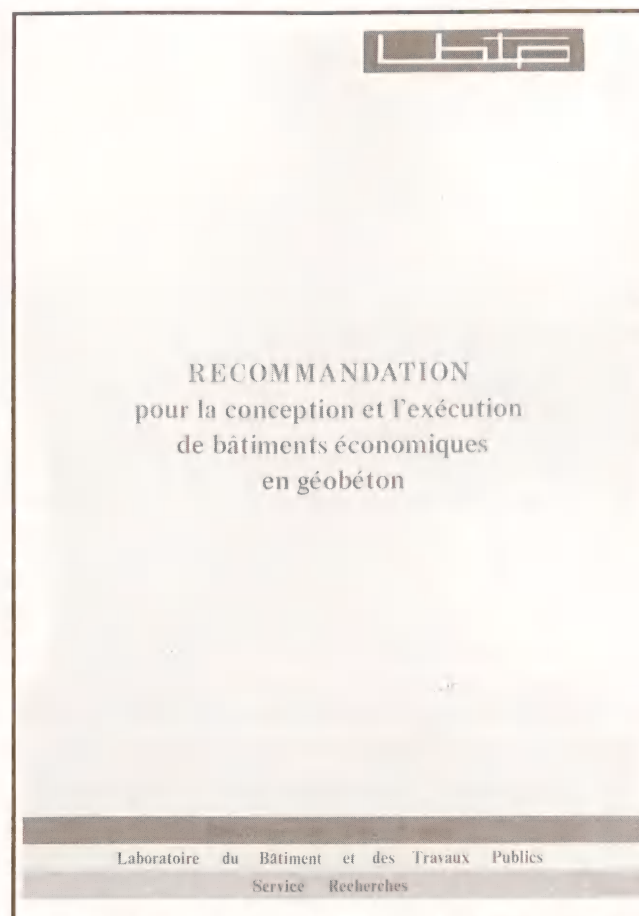
Introduction ; Burundi ; Mali ; Maroc ; Mayotte ; Rwanda ; Somalie.

Description :

This document draws together case studies on earth constructions in a number of parts of the African continent during the 80s. By example rather than persuasion, the book demonstrates the relevance of earth as a building material in a contemporary context and that a modern approach to technology and architecture is also a reality in Africa.

Comments :

Given the tendency of the media when dealing with Africa to cite failures, it has been and still is necessary to make documents available which draw attention to exemplary achievements. As well as contributing to the arguments in question, this document also proves thought-provoking for designers.



207

Simonnet J., Liautaud G., Bamba B.

Recommandation pour la conception et l'exécution de bâtiments économiques en géobéton.

LBTP, Abidjan, Ivory Coast. 1980. 210 x 297 mm, 48 pages + annexes, ill., tab., graph., bibl.

Publisher :
LBTP (Laboratoire du Bâtiment et des Travaux Publics)
Zone Industrielle 4 A
04 BP 3
CI-Abidjan 04
IVORY COAST

Chapter titles :

Introduction ; Domaine d'utilisation du géobéton ; Définition des matériaux de base-critères d'acceptabilité - Prospection du graveleux ; Choix des presses à géobéton ; Fabrication des parpaings en géobéton : Etude en laboratoire et contrôle d'exécution ; Dispositions constructives ; Caractéristiques mécaniques et physiques du géobéton ; Annexes.

Description :

This document contains a series of technical recommendations on the production method for compressed earth blocks, choosing equipment, and the building system to employ. These recommendations are based on the many years' accumulated experience of the members of the public works and building laboratory of the Ivory Coast.

Comments :

This document is based on the real experience of its authors. The latter link production and design to ensure the durability of constructions. The importance of adapting technical specifications to local conditions is stressed. The specifications given are intended only for the context of the Ivory Coast but the approach to the issue of local production of a material can serve as an example.

162

CRATerre : Houben H., Guillaud H.

Traité de construction en terre.

In : L'encyclopédie de la construction en terre. Vol. 1.

Editions Parenthèses, Marseille, France. 1989. 210 x 297 mm, 355 pages, ill., tab., graph., bibl.
ISBN : 2-86364-041-0

Publisher :
Editions Parenthèses
72 cours Julien
F- 13006 Marseille
FRANCE

Price : 280 FF (58 USD)

**Chapter titles :**

1. Construire en terre ; 2. La terre ; 3. Identification des terres ; 4. Stabilisation ; 5. Convenance des terres ; 6. Essais ; 7. Caractéristiques ; 8. Modules d'utilisation ; 9. Procédés de production ; 10. Eléments de conception ; 11. Construction parasismique ; 12. Protection de surface ; 13. Bibliographie.

Description :

This technical and scientific work covers all aspects of the use of earth as a building material. Each chapter is based on a synthesis of the most recent and serious work on each subject. It aims to be a basic aid for technicians, engineers and architects, whatever the context in which they are working.

Comments :

In the field of a scientific and technical study of earth as a building material, this document is without doubt the most advanced of the general interest works available.

CONFERENCE



166

ERAC, DCTC.

Actes du séminaire sur la construction en matériaux locaux. Marrakech, 25-26 Avril 1986.

ERAC, DCTC, Ministère de l'Habitat, Marrakech, Morocco. 1987. 210 x 297 mm, 328 pages, tabl., graph. ill.

Publisher :
ERAC (Etablissement d'Aménagement et de construction de la région du Tensift)
Place du 16 novembre
BP 543
MA- Marrakech Gueliz
MOROCCO

Chapter titles :

Introduction ; Thème I : les intervenants dans l'acte de bâtir et les matériaux locaux ; Thème II : conception des bâtiments et techniques de construction ; Thème III : aspects économiques et sociaux ; Recommandations ; Bibliographie.

Description :

This national seminar aimed to summarize the current state of the use of local materials and to define what could or should be the "local materials" production cycle and its contribution in the area of the building sector. Papers presented by local participants were complemented by external papers called for by the organizers to inform participants.

Comments :

This seminar was held in the context of Morocco; the numerical data which resulted are thus not necessarily transferable to other contexts; at a qualitative level, and from the point of view of the professionalism of the approach, the seminar has a great deal to offer, however, to all who are involved in the setting-up of a national production network and in building with local materials.

PERIODICALS

214, 223, 224, 225, 229, 232

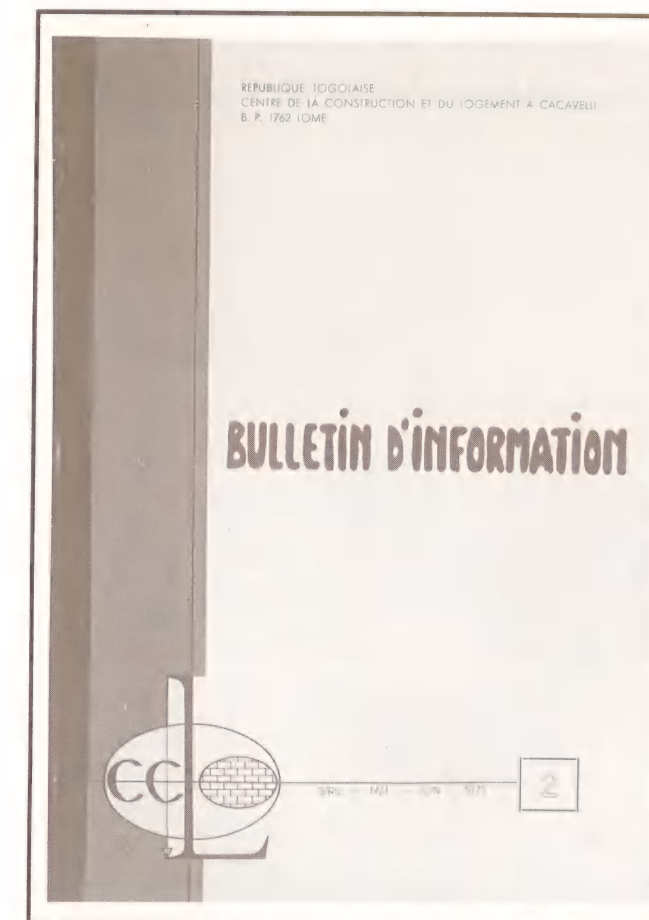
Ministère des Travaux Publics.

Bulletin d'information. CCL.

CCL, Lomé, Togo.
210 x 297 mm, 49 pages, ill., tab., graph., bibl.

Publisher :
CCL (Centre de Construction et du Logement)
BP 1762
TG- Lomé
TOGO

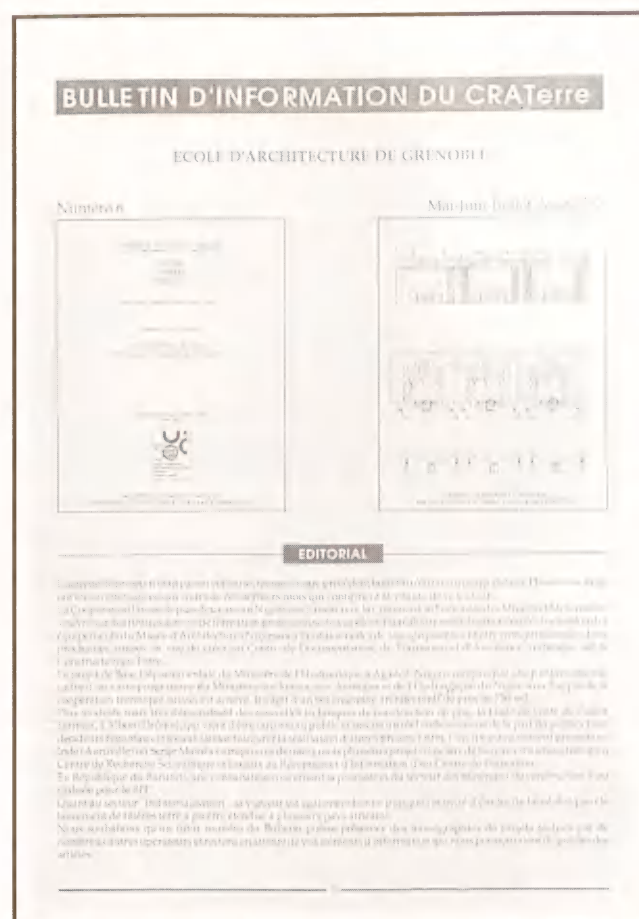
Published from 1975 to 1979, n° 1 to n° 10.
Quarterly.

**Description :**

Published by the Centre de Construction et du Logement (Building and Housing Centre) of Lomé (Togo), this bulletin aimed to disseminate technical information on local materials and the results of studies and research carried out by the CCL.

Comments :

This bulletin is exemplary in the concern of its authors to disseminate technical information adapted to the contexts and needs of their readers. Published in Africa, and based entirely on practical work, it is undoubtedly a source of information for technicians and designers or entrepreneurs working in contexts similar to those of Togo. Although ancient, many of the technical solutions presented are still relevant, and to be made aware of them often avoids having to reinvent them.



215

CRATerre-EAG.

Bulletin d'Information du CRATerre-EAG.

CRATerre, Villefontaine, France.
297 x 210 mm, 20 pages, ill.
ISSN : 0999-6257.

Publisher :
CRATerre-EAG
Centre Simone Signoret
BP 53
F- 38090 Villefontaine
FRANCE

Published since 1989.
Quarterly.

Price : 120 FF (25 USD)

Description :

This publication was originally intended to enable members of CRATerre and all the former students, trainees and correspondents of CRATerre and the School of Architecture of Grenoble to maintain contact. It aims to disseminate information on the current developments in the professional world of building with earth. It therefore covers conferences and demonstrations, current projects and latest publications.

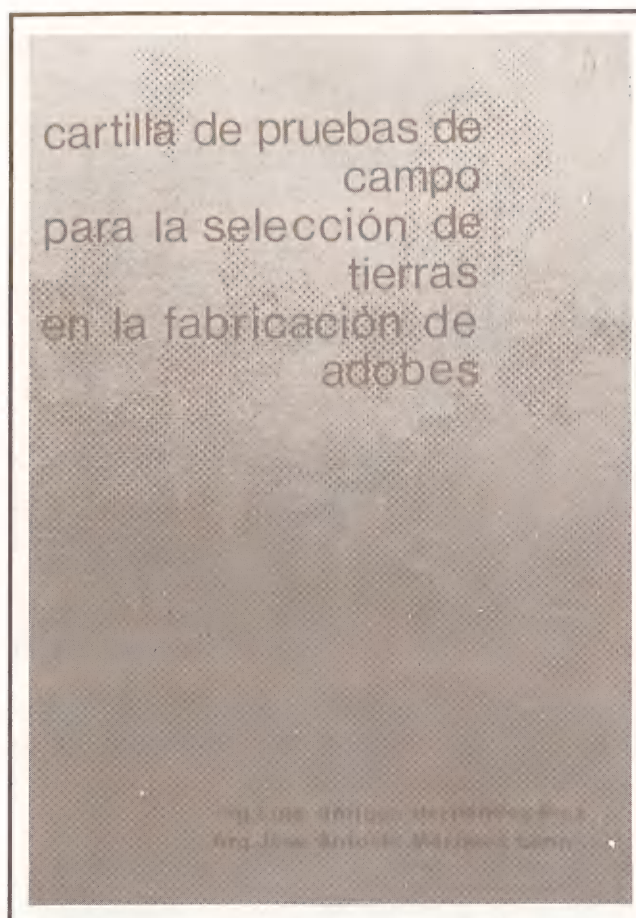
Comments :

Aimed at professionals in building with earth and all who are interested in this area, this publication enables them to be kept up-to-date with developments in this area or even to present their own work.

DOCUMENTS IN SPANISH



BOOKS



237

Hernández Ruiz L.E., Márquez Luna J.A.

Cartilla de pruebas de campo para la selección de tierras en la fabricación de adobes.CONESCAL, Mexico, Mexico. 1983. 213 x 275 mm, 72 pages, ill., tab., bibl.
ISBN : 968-29-0055-7Publisher :
CONESTAL
Auditorio National
AP 41-518
MEX- 11000 Mexico 5 DF
MEXICO**Chapter titles :**

1. Presentación ; 2. Objetivos ; 3. La tierra ; 4. Laboratorio de campo ; 5. Pruebas de campo para la fabricación de adobes ; 6. Observaciones ; 7. Bibliografía.

Description :

This work is a teaching manual for on-site test methods to assess the suitability of soil for producing sun-dried ("adobe") bricks.

Comments :

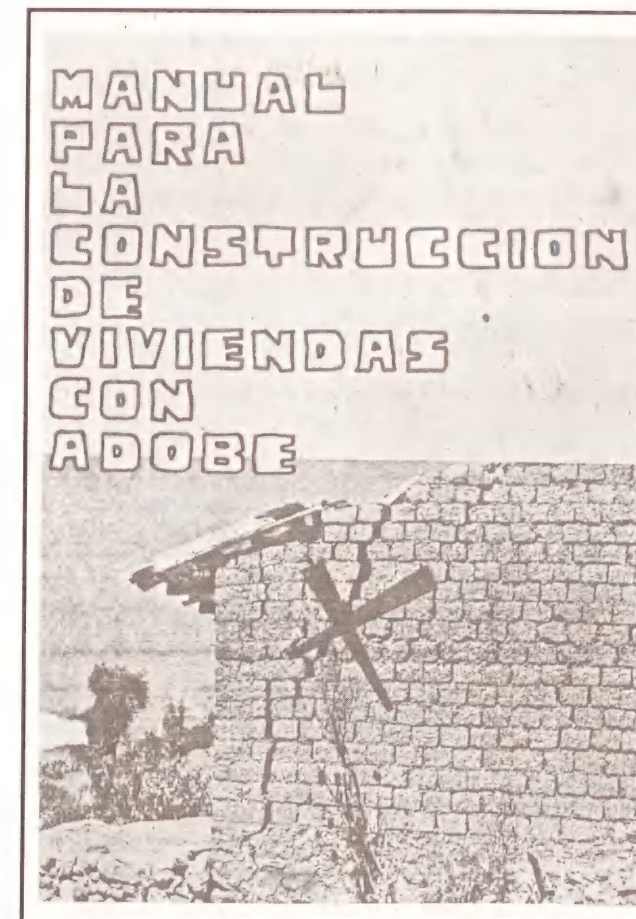
Thorough and very readable, this document provides a simple, cheap and relatively efficient method for assessing the potential of a soil for brick production. In the absence of this kind of method, the cost of laboratory testing being disproportionate compared with the product, the assessment of soil suitability is all too often approximate or neglected. It also provides a method for accepting materials which is comprehensible even to semi-literate producers.

246

CRYRZA , PREVI.

Manual para la construcción de viviendas con adobe.

Oficina Nacional de Desarrollo Comunal, Dirección de Promoción, Lima, Peru. 1971. 150 x 220 mm, 50 pages, ill., graph., bibl.

Publisher :
ONDC (Oficina Nacional de Desarrollo Comunal)
PE-Lima
PERU**Chapter titles :**

I. Antecedentes ; II. Fabricación del adobe ; III. Construcción de la casa

Description :

This manual is in effect a code of good practice on the production and application of sun-dried ("adobe") earth bricks.

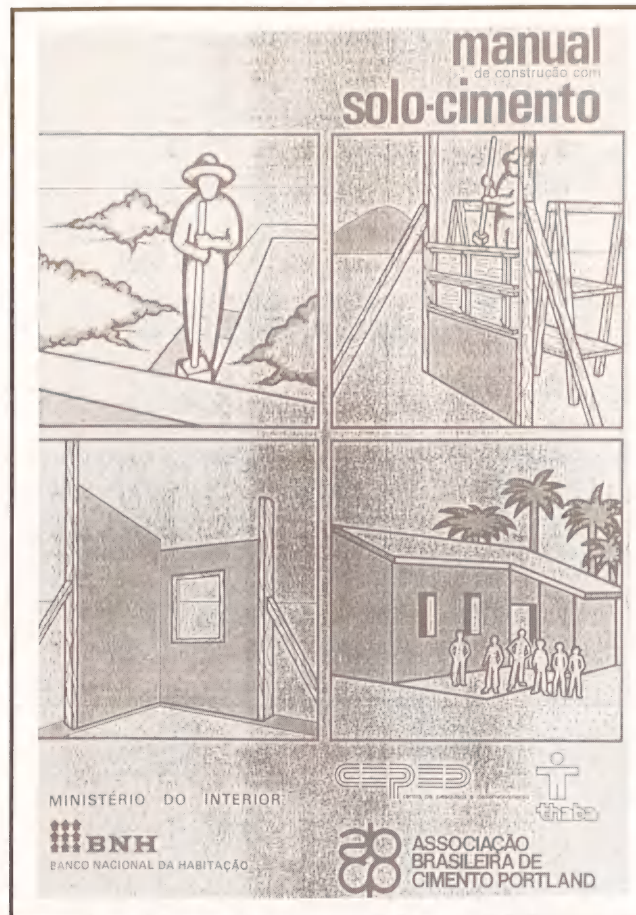
Comments :

Prepared on the initiative of the housing authorities in Peru, with the intention of providing a minimum number of building rules to limit damage in the event of an earthquake, this highly illustrated document is undoubtedly informative. The deliberately simple presentation does not deter from the technical quality of the content which even covers notions of reinforced masonry and elementary reinforcement of the structure.

DOCUMENTS IN PORTUGUESE



BOOKS



282

CEPED, THABA.

Manual de construção com solo-cimento.

ABCP, São Paulo, Brazil. 1984. 210 x 297 mm, 127 pages + annexes, ill., tab., graph., bibl.

Publisher :
 ABCP (Associação Brasileira de Cimento Portland)
 BR- Brasília
 BRAZIL

Chapter titles :

I. Fundamentos históricos da construção com terra ; II. ; Solo-cimento para a construção de paredes ; III. Execução ; Referências bibliográficas ; Anexo 01 - Fotografias de obras executadas.

Description :

This document describes an original building system based on the use of a post-beam structure in reinforced concrete and a fill-in in stabilized rammed earth. The process is studied from the technical point of view but also from the point of view of application.

Comments :

This document together with the corresponding manuals provide an easy approach to this combined technique which provides an interesting alternative for populations used to framed buildings; it also enables the construction of thin rammed earth walls without endangering the building. Although the technique is not necessarily transposable in all contexts, the document is useful teaching material on frame/in-fill structures.

284

Taipa em painéis modulados.

MEC/SG/CEDATE, Brasília, Brazil. 1988. 215 x 205 mm, 59 pages + annexes, ill., tab., graph.

Publisher :
 MEC/SG/CEDATE (Centro de Desenvolvimento e Apoio
 Técnico à Educação)
 BR-Brasília
 BRAZIL

**Chapter titles :**

Apresentação ; Resumo ; 1a parte : Introdução ; 2a parte : descrição do sistema ; Anexos.

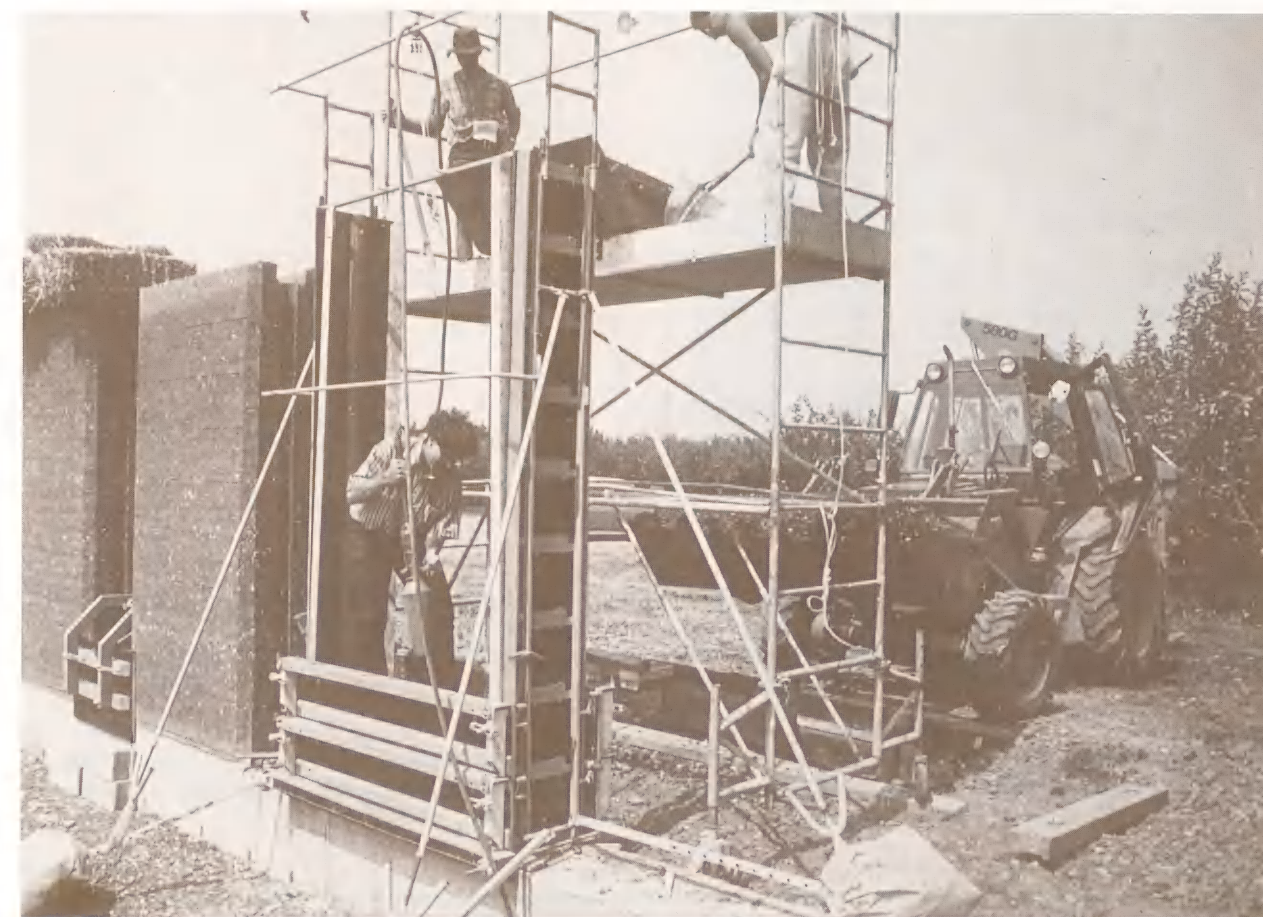
Description :

This manual describes a particular form of wattle and daub, the "taipa", where the structure is made up of panels prefabricated on the ground. This traditional technique has been revived into a credible alternative even in the modern economic sector. The manual describes all stages of production and gives examples of finished buildings.

Comments :

The wattle and daub technique is often poorly understood although examples have proved that it is suitable for integration into a contemporary context. Moreover, wooden structures are certainly of interest in earthquake areas. This very precise and abundantly illustrated document could be of interest for all builders working in areas or contexts where wood is available.

DOCUMENTS IN GERMAN



BOOKS



290

Niemeyer R.

Der Lehm- und seine praktische Anwendung.

Ökobuch Verlag GmbH, Grebenstein, Germany. 1982.
210 x 140 mm, 157 pages, graph.
ISBN : 3-922964-10-9

Publisher :
Ökobuch Verlag GmbH
Gut Kressenbrunnen
D-3523 Grebenstein
GERMANY

Price : 90 FF (19 USD)

Chapter titles :

I. Einführung in den Lehm- und ; II. Der Baustoff Lehm ; III. Das Lehmprüfverfahren ; IV. Die Aufbereitung ; V. Der Lehmsteinbau ; VI. Der Lehmstampfbau ; VII. Bauliche Einzelheiten ; VIII. Der Lehmwellerbau ; IX. Der Wetterschutz ; X. Putz und Anstrich ; XI. Der Traggerippe-Lehm- und ; XII. Lehmfußböden ; XIII. Lehmgewölbe ; XIV. Lehmdecken ; XV. Lehmdächer ; XVI. Lehmzahlen ; XVII. Das Plan- und ; XVIII. Nachwort.

Description :

This construction manual embraces all aspects, from soil identification methods and how to assess the suitability of a soil for use, to particular building systems, and including production methods. It covers all the construction techniques known in Germany: rammed earth, tamped earth blocks, cob, wattle and daub, straw-clay.

Comments :

Originally published in 1946, this work was written by an acknowledged specialist on the subject at a time of renewed interest in earth building in Germany after the second world war. This explains why certain parts are sometimes out of date, but its overall interest remained sufficient to justify its republication in 1982. Many parts, such as those on testing methods, renders, and building systems, are still in fact relevant today.

030, 291

Mukerji K., Bahlmann H.

Laterit zum Bauen. Laterite for building.
In : Report 5

IFT, Starnberg, Germany. 1978. 295 x 210 mm, 79 pages,
ill., tab., graph., bibl.

Publisher :
IFT (Institut Für Tropenbau)
DR. Ing. Georg Lippsmeier
D-8130 Starnberg
GERMANY

**Chapter titles :**

Einleitung ; 1. Laterit als Rohstoff ; 2. Laterit als Baustoff ; 3. Entwicklungspolitische und soziologische Aspekte ; Zusammenfassung ; Bibliographie.
Introduction ; 1. Laterite as raw material ; 2. Laterite as building material ; 3. Developmental and sociological aspects ; Summary ; Bibliography.

Description :

This document is a study of laterite and its potential in the field of low-cost housing construction. It therefore includes a summary presentation of the principal characteristics of the material, of its various possible applications in construction and the socio-economic aspects of its use.

Comments :

The document corresponds to the first phase of a three-stage GTZ programme aimed at setting-up a production unit for building materials based on laterite. It is a good basic reference document on this material, which is wide-spread in tropical countries, as it provides a synthesis of previous work done on the material.



297

Volhard F.

Leichtlehmnbau : alter Baustoff - neue Technik.

Müller C.F., Karlsruhe, Germany. 1986. 147 x 210 mm, 159 pages, ill., tab., graph., bibl.
ISBN : 3-7880-7321-7

Publisher :
Müller C.F.
Karlsruhe Amalienstrasse 29
D- 7500 Karlsruhe 1
GERMANY

Price : 150 FF (31 USD)

Chapter titles :

I. Einführung ; II. Die Baustoffe für den Leichtlehm ; III. Die Herstellung den Leichtlehms ; IV. Feuchter Einbau im Stampfverfahren ; V. Trockener Einbau mit Leichtlehmsteinen und Platten ; VI. Einzelheiten bei Roh- und Ausbau ; VII. Planung und Kosten ; VIII. Eigenschaften des Leichtlehms ; IX. Ausgeführte Beispiele ; X. Anhang.

Description :

This manual describes the state of the art of the straw-clay technique, which was devised in the 40s then set aside until its revival in the 80s thanks to its undoubted thermal and acoustic qualities. The document places the technique in its historical context compared with other techniques, then details all aspects from soil selection and raw materials to finishing.

Comments :

Written by a practitioner with unquestionable experience, this is the only complete, thorough and contemporary work available on this technique, which has a number of advantages.

PERIODICAL

304

Minke G.

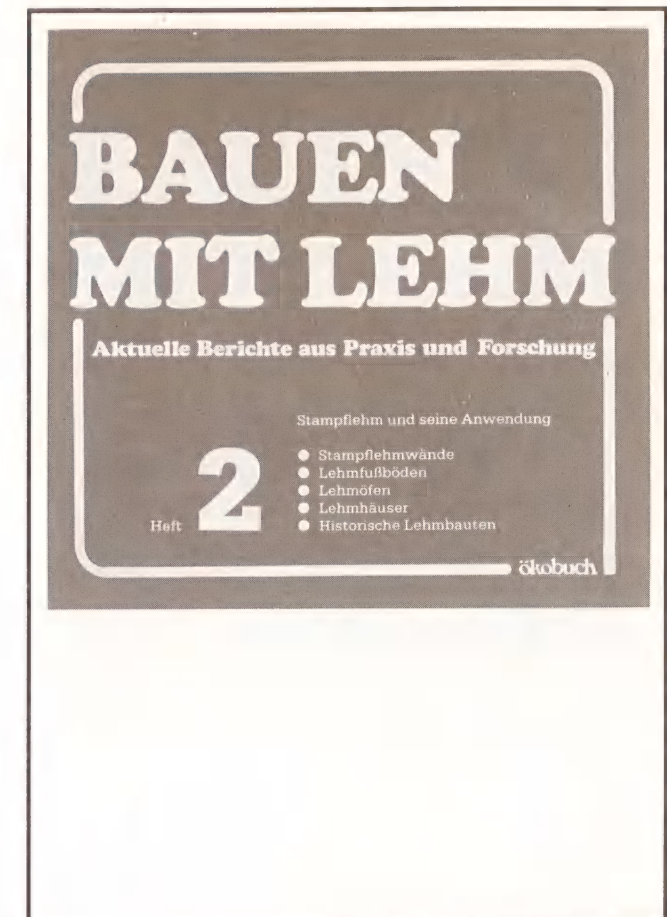
Bauen mit Lehm ; aktuelle Berichte aus Praxis und Forschung.

Ökobuch Verlag GmbH, Staufen, Germany.
210 x 200 mm, 80 pages, ill., graph.
ISSN : 3-922964.

Publisher :
Ökobuch Verlag GmbH
Postfach 1126
D-7813 Staufen
GERMANY

Published from 1984 to 1987, n° 1 to n° 6.
Biannual.

Price : 48 FF (10 USD)

**Description :**

This German journal was created during the revival of earth construction in West Germany in the 80s. It aimed to disseminate technical information and to echo the latest research in this field.

Comments :

Published in the context of what was then West Germany, the focus was mainly on bringing earth up-to-date in this area, but the authors of the journal were also concerned with possible applications in developing countries. Thanks to this journal, the reader could have access to work generally contained in publications which are more specialized and more difficult to obtain.

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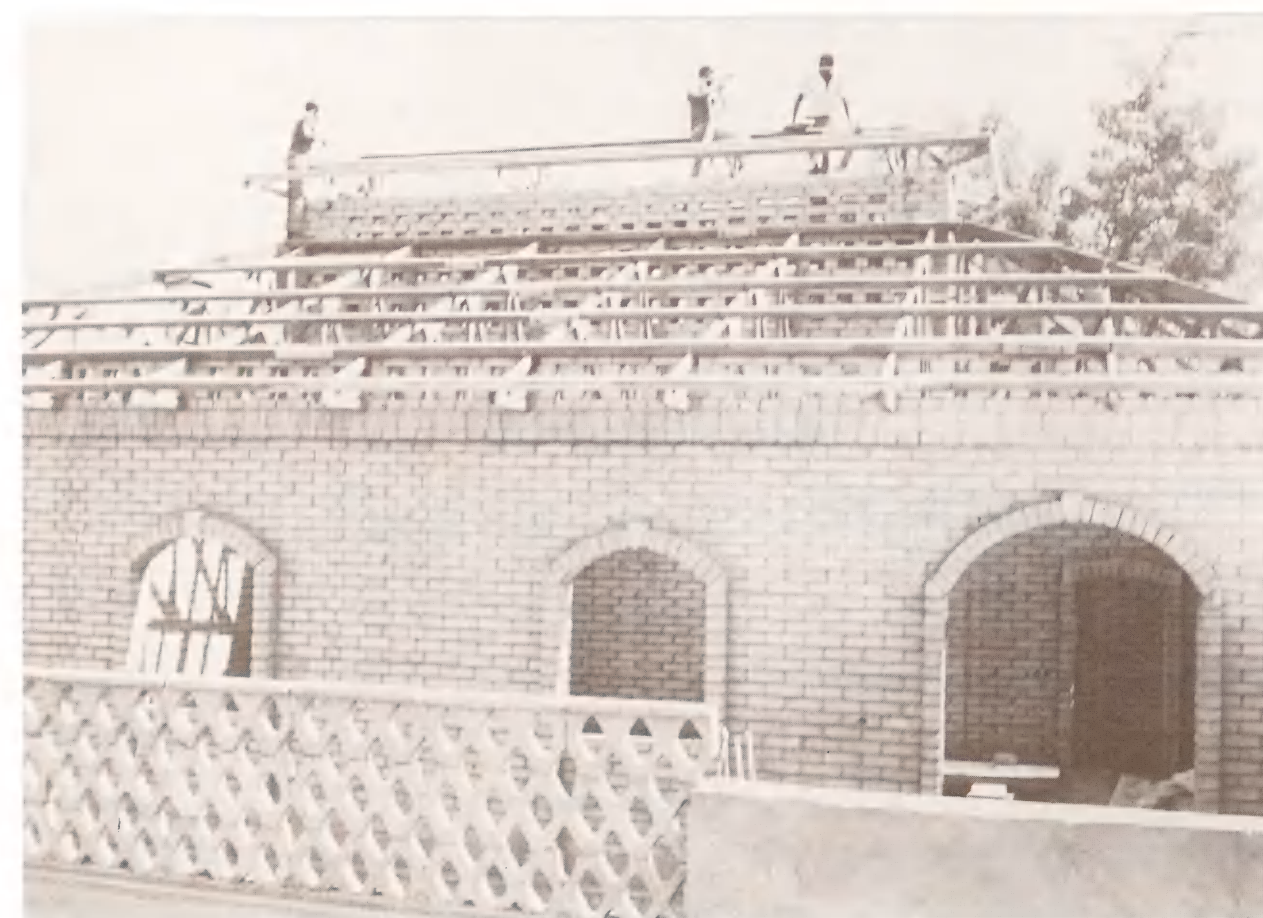
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